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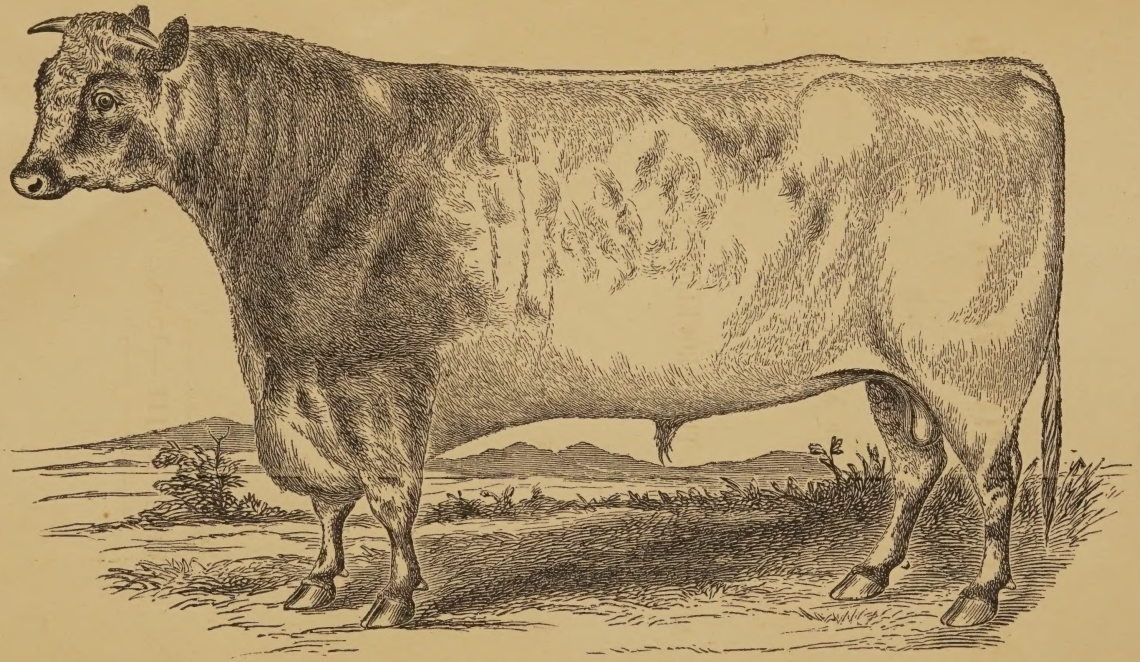

DUKE OF OXFORD.

Property of Ezra Cornell, Ithaca, Tompkins Co., N. Y. Roan; calved July 27th, 1855; bred by Col. Lewis G. Morris, Mount Fordham, Westchester Co., N. Y.; got by Duke of Gloster (11,382), out of Oxford 17th, by Lamartine (11,662); Oxford 10th, by Third Duke of York (10,166); Oxford 5th, by Duke of Northumberland (1940); Oxford 2d, by Short Tail (2621); Matchem Cow, by Matchem (2281); by Young Wynyard (2859). Duke of Oxford won the first prize, as the best Bull Calf, at the Show of the New York State Agricultural Society, at Elmira, in 1855; also the first prize, as the best Aged Bull, at the Show of the New York State Agricultural Society, at Syracuse, in 1858.

[Frontispiece.]

TRANSACTIONS

OF THE

N. Y. State Agricultural Society,

WITH AN

ABSTRACT OF THE PROCEEDINGS

OF THE

COUNTY AGRICULTURAL SOCIETIES.

VOL. XVIII.—1858.

ALBANY:
CHARLES VAN BENTHUYSEN.
1859.

630.6
NY
1858

NOTICE.

The subscriber, in submitting the eighteenth volume of the Transactions of the New York State Agricultural Society to the farmer's of New York, hopes it will be found at least equal to those which have preceded it. This is the thirteenth volume prepared under our direction, and it is a source of no small degree of gratification that these volumes have been so favorably received, not only in our own State and country, but in all the leading agricultural countries of Europe. These volumes embody the experience of the best farmers of our State, as well as important articles adapted to every branch of agriculture and the mechanic arts, prepared by correspondents eminently calculated to promote and advance to higher attainments the agricultural interest of our country.

A distinguished gentleman of the neighboring British province, in acknowledging the reception of our seventeenth volume, writes: "In looking into your last volume, I am glad to find that you are still obeying the law of progress, and notwithstanding the high character of your former volumes, your last is, I think, upon the whole, the best, I must, therefore, congratulate yourself and your valuable society on the continued progress you are making in one of the most progressive and important of the industrial arts. May you, dear sir, long be spared to advance the good cause in which, not only this continent, but the whole civilized world, have a common interest."

The distinguished secretary of the Imperial and Central Agricultural Society of France, an honorary member of our Society, writes, "I have received with lively sentiments of gratitude the generous gift which you have been so kind as to send me. The volumes for the years 1854, 1855, and 1856, works of the Agricultural Society of the State of New York. Previous to the honor of replying to you and thanking you for the gift, I have desired to read the numerous documents which they embrace, and I am

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assured that the Society has perfectly attained the design of its foundation, to improve by degrees the condition of agriculture, horticulture, and all the arts relating to rural constructions."

"No one, more than myself, is happier to applaud its progress, and I desire to be in connection with it, and declare my sentiments of gratitude and high consideration."

We have deemed it desirable that those who have contributed to the Transactions of the Society, and by whose labors they have been rendered so acceptable, should be informed of the estimate placed upon their labors by gentlemen so well informed and so capable of appreciating the work which has received their approbation. We trust those gentlemen will excuse us in thus referring to their communications, knowing, as we do, their ardent devotion to the cause of Agricultural progress.

The volume now submitted will, it is believed, prove highly useful to the practical farmers of our country. The address of Mr. Williams, at the Annual Fair, on "Agricultural Education," is an able and successful elucidation of the importance of this subject, now attracting so much attention not only in our own State, but throughout our entire country.

The farm reports which are presented, will be read with interest and profit, showing the advance which is being made in our State, and which we hope will lead many of our farmers to renewed efforts to place our agriculture upon as high a standard as that of any other country.

The treatise on the fishes of our State, their habits and the manner of rearing, a very well considered and elaborate work, will be found of great value, and we shall be disappointed if in its perusal and careful consideration our farmers do not look upon this subject very differently from their previous convictions, and be led to adopt measures by which much good will result to them by the breeding, preservation and care of the choice fish of our State.

A very excellent article on fences, and the manner of constructing the various kinds in use, with all the details of the work from its first inception in felling the tree and preparing the rails to the final completion of the fence, designed for young farmers, is given, and will aid them very materially in their work. This article is prepared in a plain and familiar manner, so as to enable the farmer properly to execute his work, and we trust it will be the means of doing much good.

The fifth report by Dr. Fitch, on the insects injurious to our forests, will prove of incalculable value, to those interested in the

preservation of their trees. We are more than ever convinced of the importance of the investigations which are making by Dr. Fitch. Some of the most distinguished entomologists abroad have given their appreciation of the value of these investigations, and extracts from the annual report of Dr. Gerstacker, on the progress of entomology, given in the report of the executive committee, is evidence of its very great value.

In relation to these investigations, a gentleman well prepared to appreciate their importance, says: "The value of the service which the State Agricultural Society has rendered to the public, in publishing the careful researches of its accomplished Entomologist, could not be easily estimated. If the State society *had done nothing beyond the publication of these studies respecting insects injurious to trees*, it would have made an ample return for all the money it has ever received."

A very valuable article,—"Report of experiments with different manures on permanent meadow land,"—by J. B. Lawes, F. R. S., &c., and Dr. J. H. Gilbert, F. C. S., is given in the report, which will be found of great value to all our dairymen and graziers.

Several excellent articles designed for this volume, and extracts from addresses delivered before societies in this State, which it was intended to insert, have been omitted, as it was found that they could not be inserted without increasing the size of the volume much beyond that of most of the previous volumes. They will be reserved for future use.

For the valued assistance given us by many of our friends, we are truly grateful, and in the great good accomplished by their kind efforts they will reap a rich reward.

B. P. JOHNSON.

State Agricultural Rooms, *March*, 1859.

CONSTITUTION OF THE NEW YORK STATE AGRICULTURAL SOCIETY.

The style of this Society shall be "The New York State Agricultural Society." Its objects shall be to improve the condition of Agriculture, Horticulture, and the Household arts.

SEC. 1. The Society shall consist of such citizens of the State as shall signify in writing, their wish to become members, and shall pay on subscribing not less than one dollar, and annually thereafter one dollar, and also of Honorary and Corresponding members.

The Presidents of County Agricultural Societies, or a delegate from each, shall ex-officio be members of this Society.

The payment of ten dollars or more shall constitute a member for life, and shall exempt the donor from annual contributions.

SEC. 2. The officers of the Society shall consist of a President, eight Vice-Presidents, one to be located in each Judicial District; a Recording Secretary, a Corresponding Secretary, a Treasurer, an Executive Committee, to consist of the officers above named, and five additional members, and five of the Ex-Presidents shall be ex officio members of the Executive Committee, and these five shall consist of the five Ex-Presidents whose term of office has last expired, of whom three shall constitute a quorum; and that the Ex-Presidents of the Society, not members of the Executive Committee, shall constitute a Board of Counsellors, to which may be referred, for consultation and advice, all questions that may from time to time arise, and in the decision of which the Society may in any manner be interested; and a General Committee, the members of which shall be located in the several counties, and be equal to the representatives in the House of Assembly.

SEC. 3. The Recording Secretary shall keep the minutes of the Society. The Corresponding Secretary shall carry on the correspondence with other Societies, with individuals and with the general committee, in the furtherance of the objects of the Society.

The Treasurer shall keep the funds of the Society, and disburse them on the order of the President or a Vice President, countersigned by the Recording Secretary, and shall make a report of the receipts and expenditures at the annual meeting in February.

The Executive Committee shall take charge of and distribute or preserve all seeds, plants, books, models, &c., which may be transmitted to the Society; and shall have also the charge of all communications designed or calculated for publication, and so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of the Society.

The General Committee are charged with the interests of the Society in the counties in which they shall respectively reside, and will constitute a medium of communication between the Executive Committee and the remote members of the Society.

Sec. 4. There shall be an annual meeting of the Society on the second Wednesday of February, in the city of Albany, at which time all the officers shall be elected by a plurality of votes and by ballot, with the exception of the General Committee for the counties, which may be appointed by the Executive Committee, who shall have power to fill any vacancies which may occur in the officers of the Society during the year. Extra meetings may be convoked by the Executive Committee. Fifteen members shall be a quorum for the transaction of business.

Sec. 5. The Society shall hold an Annual Cattle Show and Fair at such time and place as shall be designated by the Executive Committee.

Sec. 6. The Constitution may be amended by a vote of two-thirds of the members attending any annual meeting upon one year's previous notice in writing.

State Agricultural Rooms, }
February, 1859. }

I certify the above to be a true copy of the Constitution of the New York State Agricultural Society.

B. P. JOHNSON, *Cor. Secretary.*

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ABRAHAM B. CONGER, Waldberg, Rockland.

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2d district, CHARLES S. WAINWRIGHT, Dutchess.
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4th district, HENRY W. BECKWITH, Washington.
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EX-PRESIDENTS.

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THEODORE S. FAXTON, ALONZO S. UPHAM,
WILLIAM T. McCOUN.

CHEMIST TO THE SOCIETY.

Prof. CHARLES H. PORTER.

ENTOMOLOGIST.

ASA FITCH, M. D.

Monthly meeting of the Executive Committee, first Thursday in each month.
Annual meeting, second Wednesday in February.
Annual Fair, at Albany, October 4, 5, 6, 7.
State Agricultural Rooms and Museum in the new State building, State street, corner of Lodge.

LIFE MEMBERS.

A.

Allen, Wm. M., Harlem.
Allen, Lewis F., Black Rock.
Agnew, Alexander, New York.
Allen, John, New York.

B.

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Butler, B. C., Luzerne.
Babcock, F. M., New York.

*Deceased.

C.

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Earle, Morris, New York.

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Fairbanks, H., St. Johnsbury, Vt.
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Lee, William H., New York.
Leavitt, Henry S., New York.
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Morris, Fordham, Mt. Fordham.
Morris, Francis, Mt. Fordham.
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Miller, Daniel S., New York.
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Maitland, Wm. C., West Farms.
McGraw, Joseph, Dryden.

* Deceased.

N.

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O.

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Otis, H. G., Geneva.

P.

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Schenk, Wm. J., New York.
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Smith, Thomas, New York.

T.

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Thorne, Jonathan, Thornedale.
Thorne, Edwin, New York.
Thorne, Samuel, Thornedale.
Titus, James H., Malone.
Taber, Samuel T., Chesnut Ridge.

U.

Upham, A. S., Le Roy.

V.

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Van Rensselaer, Stephen, Albany.
Van Rensselaer, Wm. P., Albany.
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Van Rensselaer, R. H., Morris.
Van Antwerp, John, West Farms.

W.

*Wadsworth, James, Genesee.
Wadsworth, James S., Genesee.
*Wadsworth, Wm. W., Genesee.
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Wilkin, J. W., Orange county.
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White Wm. M., Whitney's Valley.
Woodworth, Augustus P., New York.
Whitney, Orla. H., Mexico.

Y.

Yelverton, Robert, New York.

* Deceased.

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STATE OF NEW YORK.

No. 182.

IN ASSEMBLY, APRIL 7, 1859.

COMMUNICATION

From the Corresponding Secretary of the New York State Agricultural Society.

AGRICULTURAL ROOMS,
ALBANY, *April*, 5, 1859.

To the Hon. D. W. C. LITTLEJOHN,
Speaker of the Assembly:

In pursuance of the acts of the Legislature for the promotion of Agriculture, I present the annual report of the New York State Agricultural Society, with the proceedings of the Executive Committee, and abstracts of the reports of County Societies, for 1858.

I am, very respectfully, yours,
B. P. JOHNSON,
Corresponding Secretary.

TRANSACTIONS

OF THE

New York State Agricultural Society.

Report of the Executive Committee for 1858.

TO THE LEGISLATURE OF THE STATE OF NEW YORK:

The close of another year calls upon the Executive Committee to make their annual report of the condition and progress of agriculture and the mechanic arts throughout the State, as illustrated in the operations of the agricultural societies of the State.

The year now closed has been, upon the whole, a successful one to the farmers of the State in most of their operations—for, while in some portions of our State there has been a deficiency in the wheat and barley crops, in other portions the crops have been remunerative, and the general crops of the State have been fair and satisfactory to the farmer. It is not intended by this remark to indicate that the farmers of our State should be satisfied with the present state of farming interest throughout our State. It is a fact which cannot be disguised, that as yet our farming is far less perfect than it should be. Our crops should be much larger, our whole system of farming far more economical, and the profits of farming largely increased. We cannot, however, shut our eyes to the fact that very great advance has been made by the farmers of our State, and no person conversant with the state of farming in this State twenty years since, and who has given attention to it during the past few years, but must admit that a very commendable advance has been made in every department of agriculture. But a much higher standard is yet to be secured, and we are encouraged, from the improvements of the past, to expect still greater advances in the future.

We want to increase the number of well educated and intelligent agriculturists—men who are in every respect, as well qualified for all the varied operations connected with agriculture, as are the men of other professions, who have been duly prepared for their pursuits. We want more men who, with a full knowledge of all the teachings of science, having also the teachings of actual experience, can thus apply their practical knowledge to far greater advantage. We think that the number of those, possessing in a good degree these qualifications, are increasing, and as our institutions designed to educate young men for practical pursuits shall be opened, we may confidently anticipate that New York will ere long, be furnished with a class of men to manage her agricultural interests, who will at least be equal to those of any other country. We surely should never rest satisfied with anything short of this, and if we do not greatly mistake the enterprize and public spirit of our agriculturists, this result will most assuredly be secured.

In connexion with this subject, we may properly direct the attention of agriculturists to the means which are in operation, to provide for all, an education suited to their profession; already agricultural institutions are in operation ; and in our own State, as well as many others, we may expect that during the coming year, new institutions will be opened, where instruction and practice combined will be given, from which we may reasonably anticipate the most favorable results.

We subjoin a few extracts from a very able address (by Prof. Tanner, at Birmingham, Queens College, Eng.,) upon the importance of combining science, and practice or experience, in order to prepare the agriculturist completely for his work. He remarks :

"The agriculturist may be looked upon as one who is continually inquiring of nature; and the operations he performs upon the land are more or less successful in proportion as they are in accordance with the laws which control the operations of nature. Thus errors have been detected by failures, whilst more correct systems have been established by success. Nature has thus taught the observant agriculturist how he may carry out his operations with success. Such knowledge is usually known as experience, and highly indeed, must it be valued. Experience, therefore, is based upon truth, and cannot be despised with impunity.

* * * * * *

"If the experience derived from practice is thus valuable, it may be asked, What need has the agriculturist for any other

guide? If *practice* alone can teach him, wherefore should science be brought to his aid? I reply: To enable him to separate truth from error; and from his own experience, as well as that of others, to draw those principles which are applicable to his own case, and by the aid of which the *productiveness* of the land may be economically increased. * * * Contradiction cannot exist between the principles which science dictates, and the experience which is derived from practice. They are the same in their origin, as well as in their character. The laws of nature are fixed and definite; and a knowledge of these laws is what we term science; as these laws are definite in their action, there cannot be any variation between the principles of science and the practice of art."

After alluding to the studies of Chemistry, Botany, Geology, &c., &c., he remarks: "Thus, to the agriculturist, a study of the sciences, connected with the practice of farming, offers inducements of no ordinary value, and reveals to him the laws which regulate and govern those results, to the attainment of which all his efforts are directed. * * * It is manifest that he who, with equal practical knowledge, is also acquainted with the nature and character of the bodies he has to operate on, must be in a better position to carry out improvements with economy and success.

"The record of the past justifies these hopes; for, although most of our improved agricultural practices may be traced to a foundation originally laid by experience, still the improvements which have been introduced may, in a great measure, be traced to the light of knowledge and observation which has of late years been thrown upon farming. * * * The practice of agriculture is destined, at no distant period, to be one of the most interesting branches of national industry, and in its prosecution the highest ability will be demanded. For this reason, it becomes of the deepest importance that those engaged in the practice of agriculture should be men of intelligence, having a clear knowledge of the process of nature, with which they are so constantly brought in contact, for then they will be prepared to record their results with accuracy, and to deduce therefrom correct opinions, which will lead them forward to a perfect knowledge of the true principles upon which their practice is based. I consider that no course is more calculated to promote the welfare and future progress of agricultural practice than a general diffusion of a knowledge of the sciences connected with agriculture; not that this is

to make men farmers, but it is a most important preparation for enabling them to learn the practice.

"Our endeavors should be to increase the number of those agriculturists who combine in themselves that knowledge which has hitherto been generally divided between two classes: I refer to the classes distinguished as men of science and men of experience. By combining these characters in each individual, all opposition will be dissipated; for by his knowledge of practice, his opinions will be subdued and moderated by the guidance of science; whilst his acquaintance with science will enable him to take advantage of improvements as they are introduced, to show discretion in selecting such as are suitable to his farm, and are not simply alterations, but really improvements; and it will also prepare him for co-operating in the general advance of the practice."

Farms.—During the past year, there have been entered for competition eleven farms. Three grain, one grazing, seven dairy farms—a much larger number than has ever before been presented. Each of these farms was visited by a committee appointed for that purpose; and it is most gratifying to the Executive Committee, to refer to the reports of the committees, and to the statements of the competitors, as evidence of the very great advance which has been made in our State in farm management. Several of the farms which have been examined, in all the arrangement and detail of operations, are managed in a manner that seems most perfect. The improvement in farm buildings, the attention to drainage, irrigation, and manures, the eradication of weeds, the erection of suitable fences, all elicit a most hearty approval. In one of the counties where all the dairy farms entered are found,* the change in the appearance of the country is most remarkable. A neatness and uniformity, apparent throughout all that portion of the county where these farms are situate, as reported to the Executive Committee, constrain them to mark these improvements as, in their opinion, entitled to the highest commendation. It is a subject that cannot but awake the deepest interest among the farmers of the State, to be assured that the good work of improvement, to which their best energies have been devoted, is assuming, in various parts of the State, such a gratifying character. We are greatly encouraged by these farm reports, to redouble our efforts to advance the great agricultural interests of our State in every department. Let the farmers but cordially

* Lewis.

enlist in the good work, and it will go on, until final success shall crown our united efforts.

That the wealth of a people results in no small degree from the productions of the earth, is admitted. It is, then, a matter of the highest importance that every proper effort should be made to secure such returns for the labor bestowed, as will advance, continually and steadily, the interests of the country. And it must be evident, that in proportion as the agriculturists become complete masters of their profession, in every department, so will be the increase and advance of their country.

County Surveys.—In the last report of the Executive Committee, the importance of resuming the surveys of counties was presented; and it gives them pleasure to say, that they have now under survey the county of Onondaga, in some respects one of the most interesting districts in the State. The gentleman* having in charge this work, in every respect most admirably adapted to its successful execution, finds that another season is requisite to enable him satisfactorily to complete the work. We are satisfied, from the investigations already made, that this promises to be one of the most valuable works which has yet been undertaken in our State, and will do great credit to the gentleman engaged in it, and will develop many interesting and valuable incidents in agriculture, of very great importance to the agriculture of our whole State. The Executive Committee would respectfully commend the continuation of the surveys of other counties, should suitable and competent men be found to make the surveys, whenever the funds at the disposal of the Society will permit.

The Wheat Crop.—In our last report, it was stated that a circular had been prepared for distribution, in order to gather up the whole history of the ravages of the *wheat midge*, and other insects, while the ravages of these insects were fresh in recollection. The circular was issued in May last, and addressed to upwards of one hundred individuals, including one or more in each agricultural county in the State. Returns have been received from several, to whom the circular was addressed, furnishing facts of much interest, and it is hoped that on a comparison of these various reports, by Dr. Fitch, to whom they have been committed, much valuable and useful information will be given; and if we discover no certain remedy against the ravages of the Hessian fly and wheat midge, we shall at least be furnished with data by which their destructive work may be mitigated. One principle, we

*Hon. George Geddes.

think, has been established; and that is, "That crops of wheat of a healthy growth, where the land is properly cultivated, all other things being equal, the damage from either the Hessian fly or the wheat midge is much less than where the crops are but half put in, and the wheat of a poor and sickly growth. Let the indolent, half-farmer mend his way, and prepare and cultivate his land, so as to get a healthy growth of wheat, and he will have done much to avert the ravages of these destroyers."

The Bureau of Agriculture of Canada West offered, in 1856, a prize of £40 for the best essay on the origin. nature and habits, and the history and progress, from time to time, and the cause of the progress, of the weevil, Hessian fly, wheat midge and such other insects as have made ravages in the wheat crop in Canada, and on such diseases as the wheat crops have been subject to, and on the best means of evading or guarding against them. The prize was awarded to H. Y. Hind, Esq., M. A., Professor of Chemistry at Trinity College, Toronto.

Mr. Hind has given a very interesting history of the various insects which infest the wheat, gathered from all the publications in our own country, as well as from his own examination and experience. This is a most valuable and interesting work.

The Canadian Agriculturist, in speaking of this report, says:

Mr. Hind recommends, as among the remedial measures to arrest the progress of the insects, "*good husbandry*, which implies abundance of manure, deep plowing, careful weeding, and a systematic rotation of crops. Several other methods are suggested: but until the system of over-cropping and scourging the land is given up, and a more generous course of husbandry substituted, the American farmers must make their account to be subject, from time to time, to the re-appearance and depredations of these pests, which are, in fact, in a great measure, the results of their own inefficient modes of culture."

In England it is stated "that when the average produce of wheat was only two and a half quarters per acre, the ravages of insects were far more general and destructive than they are now, when the average has risen to four and a half quarters. High farming is as destructive to vermin as to weeds, and it is *rarely* that the devastation committed on highly cultivated *land is very serious.*"

Another most important fact has been, we think, established, that when lands have been thoroughly under-drained, thus securing an earlier sowing as well as ripening of the wheat, far less

damages have been sustained from the ravages of insects. If any lands escape, it is the dry lands. It is stated by those who have answered that dry uplands have suffered much less than intervale or low lands. We have been advised in some of the counties, where the insect has been most destructive, that an unwillingness or indifference apparently exists to furnish any accounts—believing this is a visitation of Providence, and that no investigation can do any good. Wisdom would teach us that we may, by careful study and examination, learn many things in relation to subjects of this character, that might enable us to mitigate and often entirely avoid those calamities which visit us. As well might we refuse to drain our lands, lest we should alter the character of the soils, as they were brought into existence at the creation. This will never do for the progressive farmer. He has a wide field before him. He is placed here to *till the soil*, and his highest duty is *so to till* it, that its utmost yield shall be secured. Seed time and harvest are assured us, but the amount to be secured rests in, no small degree, with the intelligence and correct husbandry of the farmer. Let him, then, never relax his efforts, to ascertain the means best adapted to secure him against the ravages which assail his crops, and let him rest assured that good farming will ever pay better than poor.

Statistics.—The Executive Committee have been desirous of ascertaining the annual state of the crops and domestic stock in each county of the State. There is now no provision by law by which this can be ascertained. A circular has been issued to the several counties, and addressed to the officers of County Societies and others who were supposed well calculated to give the information desired, sufficiently accurate to form a general estimate of the average crops raised. From some of these circulars returns have been received, and their general character shows a very fair return to the farmer for the labors of the past year. While some crops have, to a considerable extent, been deficient, the general state of the other crops have been of an average return, at least, and probably in excess of previous years. These returns, as far as received, are embodied in the report, and will be found valuable for future reference, though not as full as was desired.

In some of the States the assessors are required, when taking their annual assessments, to return the number and value of horses, cattle, sheep, swine, and the yield of the various crops of grain. A very valuable mass of facts is thus annually secured, enabling the farmers to ascertain readily the products which are

best adapted to general culture, and from which he might expect the best returns. It will also enable the farmer to ascertain the quantity of each crop raised, and the best time to prepare his crops for market. It is believed that, if this subject can be fairly presented before the Legislature, provision might be made to carry out this or some other project, which would accomplish the desired end.

The State census is taken but every ten years, and the United States census also every alternate ten years, so that every five years we have a census. The basis upon which these are taken are very different, and do not enable us to ascertain with accuracy the improvement or otherwise, in the *general* agriculture of the State. We have, then, really practically a census only every ten years, and this is certainly too long a period; and if the plan suggested should be adopted, we should then have data before us every year, that might greatly aid the farmers in their work, and enable them much more profitably to regulate their mode of cropping, as the experience of every year might render necessary.

Agricultural Associations.—The importance of our agricultural associations, in the advancement of agriculture in our State and country, we think can no longer be questioned. The assembling together of 50,000 persons in our State, at an annual fair, cannot result but in good. The examination of the stock, implements, products, &c., on exhibition, leads to investigation and inquiry, and the great majority of those in attendance return to their homes with new purposes and new determination for the future, and the result we can now witness not only at every town, county or State fair, at their annual exhibitions, but also on farms in every town in the State.

A distinguished English statesman, Hon. W. E. Gladstone, M. P., at the late agricultural fair of the Royal Agricultural Society, has very forcibly illustrated the influence of associated effort there, and we may, with much greater propriety, call attention to the results secured in our own country.

He says:

"I think it may be truly observed that this—I must say distinguished—I may say illustrious Society—appears to me to supply a want which is the greatest inherent want of agriculture. If we look to the case of manufactures, it is their nature to collect themselves in enormous masses around great centers of industry. If we look to commerce, incessant communication

between every part of the commercial system of the country is the very vital air it breathes, and is naturally inseparable from commercial development. But with agriculture the case is different; for, on the contrary, its nature is to be gathered around local centers, which, under ordinary circumstances, have little or no connection or communication with one another. It is in comparison, an isolated art, and, therefore, it might follow, under general circumstances, that agriculture was languishing in various quarters of the country, simply from the want of a knowledge of the progress achieved in other portions of the land. Well, now, if I am right in saying that this is the besetting danger and difficulty of agriculture, is it not true and obvious that the Society whose festival we commemorate to-day, is, by the very principle of its construction, adopted effectually to supply that want, for its business is to bring together the men and the minds of all portions of the country? The stock of Devonshire, the horses of Suffolk, the various products of England, are exhibited in the yards to-day. The agriculture of England, through the means, mainly, of this Society, is rapidly attaining to the position to have but one heart and one mind—one common pulse that causes the circulation of the vital fluid throughout the whole system—one common stock into which everything that skill, that industry, that intelligence, that capital had achieved in every single part of the country, is made the common property of every other portion of the country."

The records which are found in the seventeen volumes of our Transactions of the proceedings of the State, county and town associations, present a mass of facts useful to the farmer, which we think it may safely be said can not be found in any other work, and which is one evidence of the good work of associated effort. Such is the opinion often expressed by gentlemen in various portions of our country, as well as many in foreign countries. Few, we presume, are aware of the great number of valuable articles which have appeared in our Transactions, written mainly by practical men, having in view the advancement of the farmer and his best interests. Inquiries are very frequently made of the Secretary for information on various matters relating to agriculture, both from our own country and from Europe, and in a great majority of cases the Transactions of our Society furnish an answer to the inquiries.

In our 16th volume, a general index of the previous volumes was given, which has elicited most gratifying approbation from

gentlemen of the highest distinction, in almost every State of our Union; and many admit that the fullness with which the subject of agriculture experimentally is treated in these volumes, is of immense importance to the agricultural interests of our whole country. Since the publication of that volume, the call for the volumes of the Society has far exceeded that of any former period, and it is much to be regretted that so far as the first five volumes of the reports are concerned, so few of them can be obtained.

We take pride in this work. It is a work made by and belonging to the farmers of New York, and well do they deserve the best thanks of the agriculturists of our Union for what they have done. We cannot, for a moment, doubt that the future will be still more instructive, and of more permanent value; the work is yours; and it can, and we cannot hesitate to believe that it will be done.

Sorghum—Sugar Cane.—There have been but few returns made of the culture of the sugar cane. In several instances syrup has been made to much advantage, and the probability is, that its culture will be increased another year.

In some of the western states, large tracts of land have been devoted to this object, and it is claimed, and probably justly, that the general results are such as to justify its cultivation as a staple crop. A convention of growers of the sugar cane was held in Illinois last fall, and the editor of an Illinois journal, who was present at the convention, gives the following judicious advice in closing a lengthy article. After noticing fine specimens of sugar, molasses, syrup, alchohol, &c., on exhibition, he says:

"These things were calculated to excite enthusiasm. *There is danger of going too far.* All these products can be made of the cane; but we must advance in the knowledge and practice of the means to perfect the molasses and sugar by degrees. It cannot be done in one year, or two years, or even a number of years, by the mass of our people. We must proceed with caution or we may be subjected to disappointment. History informs us that it was some fifteen years before a good article of syrup was made in Louisiana. We have done better. The success of our farmers has been wonderful, but further progress to them is a work of difficulty, requiring caution, prudence, knowledge and experience.

On the whole, however, much has been done. Success, to a certain extent, has been achieved by them. We shall succeed in achieving more brilliant results; but we repeat that we must proceed with caution. Our farmers *must not neglect to raise their*

usual crops—they must not proceed so far in the cultivation of this cane, that a *failure of their hopes* would be to them a serious injury. We say these things because we witnessed the enthusiasm at the convention; and because we are sure that the members of that convention will counsel caution in the cultivation of the Chinese sugar cane—a plant, which we believe, gradually introduced and manufactured, will ultimately become one of the staple crops of Illinois."

The above advice applies with equal force to our own State; and should its culture be managed with care, we may hope for satisfactory results.

Steam Plowing.—The Executive Committee offered in their last premium list, the sum of $250 for a steam engine, or other steam apparatus, that shall successfully introduce cultivation by steam, with apparatus for pulverizing the soil at as cheap a rate as now practised upon the farm—and work as well done—and available for use upon the farms of our State; the same to be tested under such regulations as may be adopted for the trial.

Mr. Charles F. Mann, of Troy, made application to the Executive Committee, to appoint judges to examine into, and report upon an invention recently made by him. A committee was appointed, consisting of George Vail, William Kelly, L. Chandler Ball, Horace L. Emery, Charles Van Benthuysen, Luther H. Tucker and B. P. Johnson, who met Mr. Mann with his machine, near the city of Troy, on the 26th of July, the day appointed for the trial. A large number of farmers were also present at the trial. This being the first trial of the machine, and the same not being complete in its arrangements for plowing, the Committee did not make any report, expecting that Mr. Mann, as he intended, would be present at the State Fair, with his engine complete for a thorough trial. Unfortunately, Mr. Mann's machine was disabled at the Albany County Fair, and he was not able to have it repaired in time to be at the State Fair. This is very much to be regretted, as from the exhibition of the machine and its operations, the Committee were all very favorably impressed, and had strong hopes, that it might be put in successful operation upon the farm. The following account of the machine and its trial, was prepared by the treasurer, Mr. Tucker, one of the Committee, and published in the Country Gentleman, as it embodies substantially all that might have been said by the Committee, we give this, in justice to the exhibitor, Mr. Mann, who is certainly entitled to great credit for his engine, which promises to be successful.

Mr. Tucker says:

"We should premise that Mr. M. is a mechanic, and that his engine was constructed rather with a view of manufacturing one capable of draught over ordinary roads or fields, than especially as a motor for plowing. Without personal experience as a farmer, he had, of course, no knowledge of the best way of making his invention accomplish most before the plow, and there was much need, through the trial of some one sufficiently conversant with those that were used, to manage successfully the attempt to draw them.

But considering the imperfections incident to the first engine constructed on a new plan, and several very discouraging circumstances that occurred, among them the breaking and consequent entire loss of the fly-wheel, the trial was really a success. The power of draught evinced; the facility with which the engine was steered; the fact that it could surmount the obstacles of rough ground, of soft, wet spots, and of considerable elevations, and all without sufficient jolting to displace or impede the working of its machinery, surprised the best mechanical judges who were present; and, while the current opinion was that the whole affair was still too crude to be considered yet in the light of a "steam plow," the hopes of the most incredulous could but be excited for the ultimate accomplishment of all that is desired in such an engine. But as a word or two as to the principal novelties involved, will perhaps be expected from us:

Like those engines which have been most successful in England, this invention of Mr. Mann's, lays its own track as it proceeds. The platform of the engine rests upon two main traveling wheels, four feet in diameter; the foward end supported by a double castor, or two wheeled truck, turned to right or left by the steersman above. These castor wheels are two and a half feet in diameter, and flanged; a slack chain of traction links, each link twelve inches long and six inches broad, revolves of itself within the flanges, so that one link always forms a square support to the convex surface of the wheel, while the chain is loose enough for a second link to be flat upon the ground, when the wheel passes off from the one behind it. This is very ingeniously arranged, although we do not know whether it is new or not.

The main traveling wheel on each side, is surrounded by an endless chain, composed of links fourteen inches long and twelve inches broad, which forms the track on which the wheel runs. But the power is not applied directly to the wheel as in the driv-

ing-wheel of a locomotive, and as is the case we believe with all similar engines invented abroad. The endless chain, (which is composed of eighteen links in all,) passes forward of the traveling wheel, around a wheel eighteen inches in diameter, which wheel is not round, but *pentagonal*, and has forks at each angle, fitting between the links of the endless chain.

The power is now applied in this way: A cylinder on each side of the boiler turns a six inch pinion at a high rate of speed, say one hundred and fifty revolutions per minute; this pinion plays into a large (twenty-two inch) cog-wheel upon the shaft of the pentagonal driver, and as the speed by this gearing is decreased, the amount of power is correspondingly and very greatly enlarged.

The driver pulls the endless chain around, which draws upon the top of the traveling wheel, thus, in reality, making each spoke in that wheel, act like a lever of the second class; having the ground for the fulcrum, the axle of the wheel for the weight or resistance, and its upper surface for the power in *prying the machine along*. The upper side of the endless chain is thus constantly tight, while the lower side is slack, and hangs down loosely enough to supply the traveling wheel constantly with a firm track or support.

This mode of applying power, we believe to be novel and original, but we have no means at hand of determining with certainty.

The endless chain, which, as will be seen, must be very strong to meet the *pull* upon it, is composed of square, iron frames, in which a wooden shoe is secured of two-inch plank; the whole is said to weigh 8,000 pounds, and to be able to carry fuel and water for five hours' work. The engine was, as we have seen, a double one, operating on quarter cranks, to avoid any dead center in turning the drivers; the cylinders carried five and a half-inch pistons, and ten-inch stroke, and the amount of steam calculated for average use was seventy pounds.

The boiler, however, did not seem quite capacious enough to supply steam to the full capacity of the machinery."

Library.—The importance of a choice agricultural library early attracted the attention of the officers of the Society, and a very good collection of valuable works were procured previous to 1850, many of them through the praiseworthy efforts of the late Alexander Walsh, of Lansingburgh, who devoted himself with untiring zeal to this work. He secured, in the city of New York, from gentlemen interested in the advancement of agriculture, at

one time, upwards of four hundred dollars' worth of books for the library. In the Transactions for 1849, a printed catalogue was given of the books in the library, up to January, 1850, then numbering 519 volumes. A new catalogue is now being prepared, which shows upwards of 2,000 volumes, and a large number of pamphlets unbound, maps, engravings, &c., the whole valued at the sum of five thousand dollars, which is a very moderate estimate. The annual amount of books and works purchased since 1850, and binding for the library, will average not far from fifty dollars per annum. The residue of the library has been secured by an interchange of the Society's Journal and Transactions with societies and individuals in almost every country in Europe, in addition to those received from the United States. As an agricultural library, we know of none superior to it in this country; and it has been found to be of vital importance to an intelligent discharge of the duties devolving upon the officers of the Society having the more immediate charge of the publications and correspondence of the Society.

The calls from gentlemen, during the year, for the examination of books in the library, are constantly increasing, and its importance, as a library for reference, can scarcely be overrated. Our books are now arranged in cases, secured by doors with locks. Books are not allowed to be taken from the library, except in very special cases, for examination. It will be seen that the principal increase of the library is by means of exchanges; and the increase from this source comprises the most valuable works of agricultural and horticultural societies of all parts of the world, and include a great number of works which could not ordinarily be secured. The importance of this system of exchanges is not to be estimated alone by the value of the books received; but it is opening up the progress of agriculture between our country and the countries from which our exchanges are received, which, without this, might leave us in ignorance for years of the progress making in our respective countries. Of its direct and positive benefit to our implement-makers, we have the most satisfactory evidence from Europe, South America, and Australia.

As complaints have sometimes been made at the regulations with regard to the use of the books, we adopt the language of the Secretary of the Smithsonian Institute, in relation to the library of the Institute at Washington, which is, in some respects, applicable to ours, though perhaps in a limited degree: "It is a fact to be regretted, but which it is necessary to mention, in order to

vindicate the restrictions imposed upon an indiscriminate access to the books, that there is, in some quarters, a lamentable want of honesty with regard to the use of property of a public character. Not only are works in many cases mutilated, merely to avoid the copying of a few pages, but valuable sets are sometimes broken by actual theft."

Agricultural Museum.—The Museum of the Society, by the kindness of contributors and donors, has become an object of interest to all who visit the rooms. On the first floor are arranged reaping and mowing machines, and various other implements, with pictures of animals, and a variety of casts of animals, &c. The second floor is occupied with plows, from the Mexican, Chinese, and early wooden plow of our own State, to the best of modern times, about forty in number. The sides of the room are occupied with cases of grain and seeds from England, Scotland, France, and the Continent, and from our own State and country—comprising a very large variety of choice products from the various countries contributing. The third floor has cases upon one side, prepared for the arrangement of the insects of the State, and specimens of the plants and trees upon which their depredations are committed; and when completed, will be one of the best and most useful entomological collections in this country. The residue of this floor is occupied with implements, maps, models, &c. The farmers and implement makers have contributed liberally to the Museum, and it is desired that they continue to furnish us with new implements and such products as are grown in our State, to enable the Executive Committee to continue a system of exchanges which has already secured some valuable varieties of grain and vegetables, which are now cultivated in this and other States to great advantage.

We would urge upon our farmers who have on hand *ancient* implements of any kind, no longer in use, to forward them to the Museum, where they will be preserved for all time to come. The day will soon come, when these implements cannot be found, unless preserved in establishments similar to this. They are useful, as showing what difficulties our forefathers labored under in the preparing their land and securing their crops; and are also very valuable as a never-failing argument to convince a large class who affect to believe that there has been no real improvement in our farm implements. This class, it is gratifying to be assured, is diminishing every year, but we desire, while a single one re-

mains, to have the evidence at hand, so that he may be convinced, and added to the number who, *having seen*, believe.

Journal of the Society.—An early and devoted friend of the Society (T. C. Peters, Esq.), in a letter to the Treasurer, desires to be informed in relation to the publication of the Journal, by the Executive Committee. It gives us great pleasure, in answer to this very proper inquiry, to give the reasons which induced the Executive Committee of 1850, "to order the issuing of a Journal of eight pages monthly, to contain the proceedings and correspondence of the Society, to be furnished to the officers and correspondents of the Society, and in exchange with agricultural and other papers, and such societies as are in correspondence with ours."

Previous to this time, the proceedings of the Executive Committee, and as much of the correspondence as could find a place, had been published in one of the daily papers in the city, and copies the paper sent to correspondents. Generally there was little of difficulty in obtaining space; but during the progress of elections, and the sessions of Congress and the Legislature, it was often very difficult to secure a place for the proceedings; and as the correspondence of the Society increased, it became a matter of earnest inquiry, how this could be met, without having written answers sent to the various communications that were being received, many of which only desired an acknowledgment. The Journal was finally established as an experiment, to meet this demand; and having admirably answered that purpose, as well as a far more important, and at the time unexpected one, it has been continued, and the Executive Committee believe with very great advantage to the Society and its correspondents. The Executive Committee have endeavored carefully to husband the resources of the Society, and they believe the Journal, instead of being a burden upon the funds of the Society, has in reality proved very valuable in securing for the Society returns far more than to compensate for the expense of its publication, averaging from $250 to about $300 a year.

The Journal is sent in exchange for other agricultural publications, to England, Scotland, Ireland, France, Belgium, Austria, Germany, Prussia, Russia, Sweden, and Norway, Cuba, Brazil, Siberia, Sandwich Islands, Martinique, Canada, New Brunswick, &c., &c. The number of volumes of interesting, and many of them very valuable agricultural, horticultural, and entomological works received in exchange, exceeded, in 1857, 100 volumes, and

about the same number the present year, showing that in this direction we are securing very valuable works, most of which, under other circumstances, we should be unable to secure, except at large cost; and in addition to this, the exchanges secured with a large number of valuable agricultural and horticultural journals of this country and Europe, which keep the Executive Committee advised of the progress of agriculture, horticulture, and the mechanic arts, and which are really indispensable, in order to be up to the progress of the age.

The number of these papers, weekly and monthly, is fifty-five United States and twenty-two foreign, the postage on which, now mostly free in exchange, would be no small item of expense, in addition to the price of the journals, many of which must of necessity be had. Our Transactions, also, are furnished to these journals.

The Executive Committee believe that as a medium of communication between the Society, the county and town societies in our own State, and correspondents, it is exerting a most salutary influence. They judge from the constant inquiries which are made for the journal, from our own State and other States in the Union, that it meets the wants of the public so far as the operations of our own Society is concerned, and does not interfere with the valuable agricultural journals of our own State, which the Executive Committee desire to sustain, and which have ever received from the Society a most cordial support.

The number of Journals issued amounts at this time to about 750.

The Executive committee have acted upon the impression that under the general powers conferred upon them, they were authorized, in a just exercise of their powers, to communicate with their correspondents and with other societies, in such a manner as would best subserve the interests of the Society. They have no personal ends to secure by this or any other measure which they recommend to the Society. Their sole object is to do the most good they can to the great interest committed to their charge, and at the least expense. They desire, however, to be advised, if the Journal is discontinued, in what manner the Society shall secure convenient access to its correspondents, and how shall it communicate with the Societies who are required by law to report their proceedings to the State Society, now numbering about one hundred. Our Journal now in some of its numbers has the ready answer to various inquiries, which every new organization needs, and which the societies already formed often make;

and it is doubtful at least whether we can so economically accomplish the same amount of work and so advantageously.

While writing this portion of the Report, we received the following letter from an early friend and efficient officer of this Society, now a resident of the South, Dr. D. Lee, of Georgia. He writes:

"I have too long delayed thanking you for the pleasure and instruction derived from the perusal of the Monthly Journal of the N. Y. State Agricultural Society. Possibly the pressure of other duties would have caused a longer delay had I not seen in the Country Gentleman a proposition to discontinue the Journal as a matter of economy to the Society. I trust none of the members of the Society will deem it improper for an early friend of the Society, although now a citizen of another State, to remark that its dignity, independence and usefulness, are alike promoted by its present means of reaching the agricultural press and the public, monthly and directly, without using the columns of any newspaper for that purpose. The same matter printed as an advertisement or as a favor, would convey a different impression to the public, and detract somewhat from the high character and position of this wide known institution. I should be very sorry to see it take one step backwards. The example of your Society has been in every respect most salutary, as the writer, who has been long connected with the agricultural press, is happy to be a witness."

A president of one of our county societies, in sending his report a few days since, writes:

"The perusal of the Society's Journal by certain farmers in our county, has awakened an interest in the minds of men previously indifferent to progress in the county and State, and whose ambition was bounded by their lines of lots, and exhibited an entire indifference relative to the improvement of even their own enclosures."

Entomology. The fifth report of our entomologist, Dr. Fitch, which is given in the Report, closes the examination of insects injurious to vegetation. We have the most undoubted evidence of the value of this work from every portion of our own State, as well as from other States in our Union, and from foreign countries. Constant inquiries are made for these Reports as soon as they are issued, and the importance of the investigations which are being made, are admitted by men of the highest intelligence and standing. Some of the leading farmers in our own State have

advised us of the great personal advantages which have been secured by them, by a careful attention to the recommendations and suggestions of Dr. Fitch; and as the work is more known and more carefully examined, all our farmers will find it of the greatest practical value to them.

As an evidence of its appreciation abroad, we give a review of the first and second Reports of Dr. Fitch, from the annual Report of Dr. Gerstäcker, of Russia, of the progress of Entomology, (1856). Dr. Gerstäcker is one of the most distinguished literary men of the age, and his approbation of the plans and arrangement of the work, as well as of its details, is most gratifying. A translation of the report of Dr. G. was furnished by Baron d'Osten Sacken, Secretary of the Russian Legation at Washington, for which Dr. Fitch, as well as the Society, are greatly indebted to him.

Extract from Dr. Gerstäcker's annual report on the progress of Entomology, for 1856. *Berlin*, 1858.

" One of the most interesting works which the reporter had to examine in preparing this report, is a treatise of Mr. Asa Fitch, on the insects which appear as noxious in North America, under the title "First and Second, etc." The principal aim of the work is a practical one—the author having been invited by the Agricultural Society of the State of New York, to prepare a detailed report on the insects, which, in that country, appear as noxious to agriculture, to forests and gardens, on the injury which they cause, and the best remedies against them. This task is solved by adopting, instead of the systematic order generally used in works of this kind, another arrangement in which the author mentions the different plants (mostly trees), in connection with all the insects which were known to him as injurious to them.

This arrangement recommends itself by the practical advantage that it facilitates to the beginner the determination of the species; at the same time it was rendered necessary by the circumstance that the observations of the author lasted only for the short period of two years, and, therefore, could not have possibly exhausted the subject. Among the insects circumstantially discussed in this way, seventeen occur on the apple tree; two on the cherry, five on the American walnut, by one on the larch, the maple and the poplar, eight on wheat, five on corn, and one on hops and cabbage. The greater number are lipidoptera; after those the most numerous are gemiptera and diptera, although the

other orders are also represented. This practical side of the work must of course afford much more importance in North America than in Europe; nevertheless, the numerous illustrations offered to the reader about the natural history of other insects which are in an immediate or a more distant relation of the noxious species, have a general scientific value. It is obvious that the descriptions of North American insect lives, found in the work, must offer many things already known; first, from the analogy of the North American fauna with ours, and in the second place because the work was intended for a wide circle of readers; but not only is the liveliness of the author's mode of exposition highly attractive, but besides that the work contains so numerous and so valuable observations on insects of the different orders, that certainly nobody, who studies entomology in a scientific way, will read them without gratification. At the same time, the knowledge of the American species receives here a considerable addition, not only that among the noxious insect many were new, and that to these a description of allied species are added, but the author skillfully manages—passes off from them to other—apparently distant treasures, which he explores. So for instance speaking of the Aphides noxious to fruit trees, he attaches to them an account of all insects connected with them by inimical or peaceful relations, as ants, deptera (septirites), and the larva of hemerobius, caryropa, coccinella and syrphus; he takes advantage of this opportunity further to give a description of all the caryropa and hemerobia of North America known to him, passes from these insects to their parasites, etc., although the connecting link between these various objects is sometimes loose, (for instance, the description of the *Porcellio*, found in the wood dug by larva*); nevertheless, it serves to add to the fullness of the material offered, and to increase the interest.

If on one side the author shows himself most prominently as an excellent observer, who, armed with the most thorough knowledge of the subject, knows how to attack, with the greatest success, the as yet existing gaps in our information, on the other side he has not at all neglected, as has often been done in similar instances, the scientific, systematic side of the subject, but has advanced it with equal success. All the descriptions of new species the author gives, are accompanied with detailed accounts

* This remark is very just. The *Porcellio* (sow-bugs) are not injurious, and have no connection with the peach borer, beyond the fact that they are always found crowded together in the holes which the borer excavates. Therefore, being such common things, as not one of our American species had ever been described, I took that opportunity to name and describe them.—*Fitch.*

about their difference from, or analogy with, already described species, and at the same time he determines the genus to which they belong, according to older and newer works. In a few instances only, as in speaking of chryropa and hemerobius, and of several lepidoptera, the author has not been acquainted with some previous publications, so that a part of his species will probably be identified with former ones,* but as these works, or at least some of them, belong to the most recent period, their omission can scarcely be made a reproach to him.

As to the publication of the work, besides four plates on stone, showing some of the most noxious insects, the text is furnished with numerous wood cuts, illustrating chiefly the former states of the insects, and the deformations produced by them."

Essays.—Some very valuable essays have been submitted to the Executive Committee, which will be found among the papers presented. One upon the Edible Fishes of New York, is a very minute and valuable work, which cannot but prove in the highest degree conducive to the interests of our State.

Practical experiments in drainage have also been presented, which, add to the already numerous testimonies in the Transactions, the most conclusive evidence of its necessity, and would seem almost to render it unnecessary to urge this matter upon the attention of the farmers of our State. But upon this, as upon every other improvement in agriculture, it is necessary to give line upon line, and precept upon precept, so that the mind, not reached this year, may be arrested hereafter.

THE ANNUAL FAIR.

The eighteenth annual fair of the Society was held at Syracuse, on the 4th, 5th, 6th, 7th and 8th days of October. The Society returned to the city of Syracuse for the third time, associated with one of the most successful fairs that has ever been held in the State, with a confident expectation that it would meet at this central position, the noblest results of the progress of the agricultural cause, and the enthusiastic support of the people. It was not disappointed in either of these results.

The period of years that had elapsed since the fair had been held in this city, had wrought great changes in the ranks of those who had been in attendance. The great orator and statesman

* This is no doubt very true. It is impossible for me to obtain but a small part of the amount that is published on this science in the different countries of Europe; and important works are liable to remain unknown for years after their first appearance. Hence, no doubt, I am frequently groping in the dark, where some recent European work, were it in my hands, would give me clear light, and several of the species which I suppose to be new, will very likely turn out to have been previously described.—*Fitch.*

who gathered around him, such welcoming thousands, and also gave his illustrious example to the pursuits of agriculture, had passed away.* The city had lengthened its line of warehouses and dwellings; the nine years had given the State an increased population, and augmented resources.

Nothing but a sudden and most unexpected period of rain and cloud, which occurring on the Thursday of the fair, prevented the attendance of the people from reaching an exhibition equaling the most memorable in the annals of the Society; and even on this day, the number was very large, and the results of the entire fair were such as to give to the Society its highest encouragement, the fact of the support of the people. It is by the voice and will of the people, that the State Agricultural Society was called into being and is sustained; and those who have had charge of the affairs of the Society, have never forgotten that the approbation of the people is their highest reward. Syracuse was thronged with a crowd who examined every department of the fair, with a close and intelligent observation, testing the value of every improvement, and taking to their homes, such lessons as the intelligence of the American farmer never permits to remain unimproved.

The citizens of Syracuse selected a fine area for the fair. The grounds were spacious, and arranged so as to provide for a proper display of the exhibition, and with buildings so prepared, that all the exhibitors found space and opportunity for the presentation of their works of art and usefulness and beauty.

From year to year, a closer attention to the buildings of the fair is demanded, the articles exhibited are valuable to an extent that requires protection; the increased skill that will not be satisfied, except with that which is the most accurate and finished, must have, even for their temporary exhibitions, structures that can resist the storm. The experience of many years, have convinced the Society of these necessities of the fair, and it is at each annual return of the show, a great satisfaction to know, that the citizens of each locality, give their best efforts to the labor of these arrangements.

This fair will never be forgotten by those who are looking to the Society, as the encouraging or fostering agency of the people, towards the progress of agriculture. Before a visitor had entered the gates, the success of the Syracuse fair was complete. It gave its full tribute to the truth of the reports which, from year to

*Hon. Henry Clay.

year, the Society has published, of the improvement in stock, the advance in mechanics, the success in all the departments of culture. The entries were very numerous, shed and stall were crowded, and it was certain, on the first day of arrangements, that the farmers, and the ingenious, and the working men that devise and contrive, and invent for the prosperity of the farm, realized the value of the State fair, and had gathered in its area, the best results of their skill. The State of New York had full reward for its liberal policy towards agriculture, in the collection to be found at Syracuse, on that day. In the earlier years of the Society, the fair was indebted to a few men, men of real enterprise, men who knew in advance, the directions which the good judgment of the farmers in our State would take; it was the debtor of these gentlemen for the fine varieties of the very best breeds of stock; there were fine herds and few owners; but in this fair of 1858, a nobler result was seen; there were the same superb cattle, the same choice varieties, *but there were many owners.* It was the proof of the gratifying fact, that the farmers of the State had *learned the value of the best.*

The Society, for many years, made its best efforts to accomplish just this result, and it was a source of great satisfaction to see that the instruction it had disseminated had its harvest already; the commendation from the thousands who were in attendance on the days of exhibition confirmed this success. The implements were an important feature of the fair. While there is a superabundance of that immature ingenuity, which, through a series of intricate movements, liable to quick disarrangement, attempts to imitate the most difficult operations of human labor, there are also those who move steadily forward to the very best results, simple and strong as they progress.

The Society found at this fair a very large variety of all machinery that could facilitate the work of the farm. The whole circle of the year's labor, from the plow to the granary, was represented. The use of these machines by the practical farmer, by the man who will be convinced only by the result and not by the promise, is a sufficient evidence of what has been done by that encouragement, which these annual fairs have extended towards the men who have given the farm these untireing, obedient arms of wood and iron.

The Society, in this exhibition, has achieved one of the prominent objects which has ever been kept before the farmers—improvement and excellence. The exhibitors in improved stock

were more numerous, and the animals shown, as a whole, superior to any ever shown on our grounds; and many of the visitors from other States and Canada, expressed themselves that, in their opinion, so good a show of fine animals in the breeding departments had never before been brought to their notice. Another feature most gratifying was the perfection of the grade cattle on exhibition. Of these, many of them might challenge competition in all the points constituting a good animal, and these of various crosses from the Short Horn, Devons, and Herefords; when it is known that the stock represented about one-half of the farming counties in our State, it will be seen that the distribution of improved stock is widely extended, and the increase of wealth to the farmers, by this stock alone, amounts to an immense sum.

The fat cattle were of extraordinary excellence, showing that we have arrived at great perfection in this direction. Small bone, aptness to fatten, meat of the best quality, and laid on in the right place, so that the excellent judges in this class declared they had never seen the cattle excelled, and never had found such difficulty in deciding the prize animals.

The show of horses, sheep, swine, and poultry, was uncommonly good, and all evinced a most gratifying advance.

The domestic department was well sustained: dairy, grain, and vegetables, though not as large as former years, were of excellent quality. The floral and fruit department was not equal to exhibitions heretofore, in extent, but very satisfactory as to quality.

In implements, we think so extensive and good a show of new and valuable implements was never before presented at our fairs. Upon the whole, we think our farmers must have felt proud of the show presented to the public, and the unalloyed satisfaction expressed must have been most gratifying to the exhibitors, and must have satisfied them that they labored not in vain.

Another fact, we think, has been established by this exhibition, that improved breeds of cattle do not deteriorate in this country. Upon the ground were several imported animals, of very great merit and renown, and yet we heard from judges well prepared to give an opinion, that no finer animals could be found than among those bred on our own soil and by our own breeders, fully sustaining the character of the choice animals from which they were descended.

The exhibition of the prize cattle and horses, on the last day of the exhibition, was one of its most attractive features, and the people could scarcely be satisfied with their examination of the

so rich specimens which were marshaled before them, under the charge of Maj. Patrick and his assistants. Many a man who, previous to the Fair, had imagined that his stock was good enough for him, concluded that what he saw was far in advance of anything he had ever before seen, and as an evidence of true conversion in many cases, the purchase of some of this fine stock to adorn the farm, gave the most convincing proof that the work of improvement from this time forward has some new and energetic laborers in the field.

A very interesting feature, during the Fair, was the presentation of the *Prize Banner*, awarded to the New York State Agricultural Society, at the National Horse Exhibition, at Springfield, Massachusetts.

On Thursday afternoon a large assemblage convened upon the grounds near the building prepared for the purpose, and were called to order by President McCoun, who introduced to them Solon Robinson, of New York, who addressed them as follows:

Mr. President and Gentlemen of the New York State Agricultural Society: I have a very pleasant little duty to perform. I come, sir, as a bearer of a trophy from a field of contention, where it was honorably won, and I desire to place it in your hands, that it may be preserved, among other valued mementoes, in the Hall of this Society, at the Capital of the State.

Unlike the trophies of war, which all nations receive with oblations to the victors, and preserve with care, this is a banner more nobly won—more worthy of preservation—for it is the banner of PEACE.

It is worthy of preservation, that your children may look with delight at the lessons it teaches. It will show them that the highest order of artistic skill has been devoted to honor one of the most common of our domestic animals—the companion of civilization—the faithful, intelligent servant of man in almost all ages and states of society. It will show them that an artist of the highest order, and that artist A WOMAN, has found a cause of inspiration, and work for her pencil in so common a place as a horse-market. It will show them, by its inscription, why it is preserved as a record of honor to the State of New York. It is because the farmers of the State are breeders of such fine horses as are worthy to be shown in competition with the horses of other States at a great National Horse Show.

In my opinion, the organization which led to that show has done more to infuse a spirit of improvement into the breeders of

horses in this country, than any other in America. It has worked as admirably as the little leaven in a large loaf, and diffused its effects throughout the whole country.

You can see what effect it has produced upon the people of this State, for it induced them to exhibit enough of valuable horses at the Third National Show, to win this beautiful prize banner, and I trust that every person who witnessed this presentation, or reads an account of it, or who looks upon that banner hereafter, as it hangs upon the walls of your attractive rooms at Albany, will feel a new stirring-up of the spirit within that will make him exclaim: "And I, too, will be an improver of the stock of this animal, so indispensable to man."

I shall now read a letter which will explain why I have engaged in this pleasant duty. It is dated

OFFICE OF HAMDEN CO. AG. SOCIETY,
SPRINGFIELD, MASS., *Oct.* 2, 1858.

"B. P. JOHNSON, Esq.,

Secretary of the New York State Ag. Society:

You are already advised that the managers of the Third National Horse Show, recently held here, under the auspices of this Society, among the premiums offered a Prize Banner, to be presented to the State Agricultural Society of that State, other than Massachusetts, which should, by its citizens, enter for exhibition the largest number of valuable horses. The chairman of the several committees of judges are designated to award the banner. In the discharge of this duty, the judges found the entries by citizens of New York and Vermont so nearly equal in the number and value of the horses from each of these States, that they were exceedingly embarrassed in deciding between them. They were, however, promptly relieved from this dilemma, by the generous offer of one of the managers, a citizen of Springfield, to have a duplicate of the banner made, that one might be presented to the Society of each State. As you will see, it is a copy of Rosa Bonheur's much admired painting of a Horse Fair, by Ackerman, a distinguished artist of New York, and an exact duplicate can doubtless be made.

The award of the committee was publicly announced by their chairman, in appropriate remarks, addressed to Solon Robinson, Esq., who acted for your Society in your absence, and to Mr. Bush, who appeared in behalf of the Vermont Society. The copy designed for your Society has been forwarded to you by express.

I very much regret that indispensable business engagements

will deprive me of the pleasure of visiting your Fair at Syracuse the coming week. And in the absence of other members of our Board of Managers, I have, in their behalf, requested Mr. Robinson to act for them, in case any more formal presentation is deemed desirable and appropriate.

Allow me to add that we feel grateful to the citizens of New York and Vermont, who contributed so largely to the eminent success of the exhibition. They will bear in mind that the entries from Connecticut followed closely upon them, and as we consider a National Horse Show at Springfield an established institution, we trust they will be stimulated by their present success, to renewed and increased efforts at our future exhibitions for a sole mastery.

In behalf of the managers, I am, sir,
Respectfully yours,
GEO. BLISS, *President.*"

And I, too, hope that we shall all be stimulated to increased efforts for a sole mastery of all that is calculated to advance the great interests of all agricultural improvement.

At the close of Mr. Robinson's remarks, he said that he had only to state that the crowd at Springfield settled the question as to the propriety of awarding the banner to the State of New York.

Those present at Springfield fully coincided in the verdict of the judges, and the announcement that New York was to be honored by a presentation of this, or a similar banner, was received with three cheers. I ask, he said, that you will return the compliment with interest, and that you will now join me in three cheers. (Three cheers were heartily given, in response to Mr. Robinson's request.)

To which Mr. McCoun, President of the State Agricultural Society, replied:

Mr. Robinson, Gentlemen of the Society, and Fellow-citizens: In becoming the recipient of the elegant banner which you, sir, have been the means of presenting the Society which I have the honor here to represent, has but given an additional evidence of its utility and importance, as one among the most prominent institutions of the State. Comparatively, a few of the breeders and owners of that most noble animal, the horse, were recently attracted, by the liberal offers of the Hampden County Association, of Massachusetts, to take a part in the exhibition at Springfield, in that State; and they repaired to that field, not of war, but of civic honors, which was to be contested in the true spirit of emu-

lation and enterprise; and the honor was nobly won, not exclusively, but jointly, by the State of New York and her sister Vermont. The exhibitors from this State, therefore, contributed as largely as any other to the success of that show, and to them the honor is due, which, by the presentation of this banner, is reflected upon the character and high standing of New York, as an agricultural and highly improved State.

The efforts of this Society have contributed largely, in my judgment, to the triumph we have now realized, and nothing is more appropriate than that we should be the depositary of this trophy of the horseman's achievement.

It is with a feeling of pride that, in behalf of this Society, the trust of keeping and preserving this banner, is committed to our hands. May it long be displayed in all its beauty upon our walls, and be handed down to succeeding ages as a choice memorial of the days of our prosperity as a Society, after time with us of the present generation is no more.

Address.—The Address, by President Joseph R. Williams of the Agricultural College of the State of Michigan, on Friday, gave to the Society the testimony which they knew would be appreciated by the people, of the kindness of the principal of a school to give the farmer all the light that science sheds on his occupation. A large audience surrounded the orator. By his side were seated not only the present officers, but many of those who had held the different stations of its supervision in former years. It was a judicious presentation of this important subject, of such great interest at this time, when the walls of an Agricultural College are rising in our own State. President Williams proved the results of the institution under his own charge, giving assurance that the school for the farmer educates practical men—men that can as well labor as study.

The Society was honored by the presence of the Ex-President, Martin Van Buren,—always a friend of the cause—by gentlemen of the Legislature, and by many of those enterprising men who, having sustained the cause of progressive agriculture when it was feeble, are welcomed by every man in this day of its strength. It was a source of much regret that His Excellency, Gov. King, was prevented, by official duties, from attending the fair as he desired.

The Society expresses its acknowledgments to those ladies and gentlemen who came from all parts of our State to act as judges in the different departments. The assiduous care which was

given to the selection of the best—always a most difficult task—is honorable to them. It is by their assistance that the fair is made of such value to the exhibitor.

The effect of this most successful fair will be to encourage the Society to renewed efforts and onward movement in every department of its labors. The gathering of the people at Syracuse is the continuation of the cordial support of other years. The State has made the department of agriculture the object of its constant favor, and thus sustained, the Society proceeds to its augmenting responsibilities and duties.

The report of the Treasurer shows that the total receipts of the year have been $18,356.27, and the expenditures $15,705.34, leaving on deposit, to the credit of the Society, $2,650.93.

B. P. JOHNSON,
Corresponding Secretary.

ADDRESS.

BY JOSEPH R. WILLIAMS, PRESIDENT OF MICHIGAN AGRICULTURAL COLLEGE.

Mr. President and Gentlemen of the New York State Agricultural Society:

I propose to speak to you to-day upon Agricultural Education, a subject that has heretofore engaged your earnest deliberations.

The relative importance of agriculture, as a human pursuit, demands little discussion. Should vegetation be suspended for six months, all animal life would perish, and our race become extinct. All industry, all prosperity, all human existence then, depend on agricultural production. We often talk of manufacturing countries, of commercial countries, of agricultural countries, but there is no large community, whose agricultural interests do not far exceed all other interests combined. Great Britain is perhaps regarded as the most exclusively manufacturing and commercial nation that has ever existed. Yet vast and wonderful as her manufactures are, penetrating as her commerce does every ocean and every inlet on the face of the globe, yet just so far as she excels other nations in commerce and manufactures, she excels them in agriculture also. The returns of her income tax show, that two-thirds of all the net income from the industry of the empire is derived from agriculture. In some nations one-half, in others nineteen-twentieths of the people depend on the soil for subsistence. The average is probably seven-eighths. Such being the great controlling fact, the trades, pursuits and professions, which the subdivision of industry, among civilized men, renders necessary, have been the especial objects of protection and sympathy, while agriculture, the nursing mother of all pursuits, just begins to attract that aid and encouragement which its relative importance demands.

When we look abroad upon the magnificent spectacle these grounds present to-day, we are not surprised that your great annual festival has become national in its character and its attractions, for it speaks trumpet tongued of a nation's present capaci-

ties and future grandeur. When we look at that long array of majestic cattle; at the splendid combination of symmetry, speed and strength, which those matchless horses present; the sheep with their ponderous fleeces; the fruit so richly tinted and so luscious, that if a modern Eve should be arraigned for plucking, no gallant jury would find her guilty; the machinery and implements, ranging from the powerful grain reaper to the most exquisite garden utensil, the most stubborn mind must be filled with admiration and patriotic pride.

Agricultural improvement has received more impetus during a single generation than during the six generations preceding. Yet progress has been very perceptible, though very gradual, for two centuries. The England of Victoria supports seventeen millions of people in far greater plenty than the England of James II. supported five millions; and the Prussia of to-day sustains with greater abundance her seventeen millions than the Prussia of the Great Frederic supported one-quarter of that number. The improvement is felt in civilized Europe among the people. as well as manifested in efforts almost gigantic. The rescue of the vast marshes of Tuscany, to become again, as in ancient times, the abodes of a busy population; the reclamation in Russia, near St. Petersburgh, of a wide area of similar land; the draining of Haarlaem lake, in Holland, by steam machinery, the most formidable of all undertakings in the cause of agriculture, and planting an industrious people on its former bed; and in England the conversion of the fens of Lincolnshire into productive estates; the extensive irrigation and draining over the whole breadth of the island, are cheering evidences of noble progress.

Forty years since there were no fairs, no periodicals, no discussions, few inventions of farm implements, and only at long intervals were new breeds and seeds disseminated. In our country, I think every candid man will admit the great improvement during the last thirty years. Travel along any highway, and he will be struck with the improved size and health of the whole cattle of the country. The sheep have improved in quality and doubled in value. In implements used, there has been a general, though not entire, revolution. Grain crops, fruits and vegetables, have improved. The change is as marked in the superior address and increased intelligence of the masses of men. Offensive exhibitions of poverty are witnessed only at longer intervals, and in fact rarely seen at all. We need not go to the tax list nor the

census; we find convincing proofs of thrift in increased personal comfort, and increased national wealth.

I would gladly continue the contemplation of the fairest features of the subject. Let us view it, however, in a gloomier and far more suggestive aspect, more worthy of your serious reflections. This splendid exhibition does not tell the whole truth. It is not a type, either of the actual condition, or the actual husbandry of the whole country. It is selected—it is exceptional. It affords evidences of what glorious results can be accomplished, rather than of what has been generally attained. Thousands to-day witness for the first time the perfection and beauty to which animal and vegetable productions and agricultural implements can be brought. A new world is opened to them in culture. What proportion of the farmers of the State raise such stock, or grain, or vegetables, or use such tools as this exhibition affords? One excels in horses, another in sheep, another in cattle, another in large crops of grain. But each production depends on the observance of the like inexorable laws. A farmer who excels in one could excel in all. But I will venture to say that there are not twenty farmers in this State who carry the same comprehensive knowledge and fidelity into all the details of their business, and bring all the products of their industry to anything like an equal perfection.

Turn with me to the census of 1850, and you will find that the average production of wheat in the State of New York was twelve bushels, of corn twenty-seven bushels, and of hay one and one-eighth tons per acre. You will find sufficient evidences within these grounds, of crops three or four times as large. It will be readily conceded that these crops can be and ought to be doubled. Allow for increased area under cultivation at this time, double the crop, and then deduct one-third of the increased production for increased expense of cultivation, and the loss to the State of these three crops, stinted and deficient as they are, is at least $50,000,000.

This is not all. New York probably has 15,000,000 acres of cultivated land. All over her surface are exhausted and neglected fields. They have been cropped and over-cropped; no subsoil plow has penetrated them; they are renovated by no green crops, no rotation, no fertilizers. So much area and capital lie idle and useless. That 10,000,000 acres of land in New York are annually damaged twenty cents per acre, would be a moderate calculation. Here is a loss of $2,000,000 annually.

Let us generalize a little. Let us apply similar calculation to the whole Union. The average production of wheat in the United States, in 1850, was less than eleven bushels; of corn, less than twenty-five and one-half bushels; and of hay, one and one-fifth tons per acre. The corn crop was valued as $296,035,552, the wheat crop at $100,485,944, the hay crop at $96,870,494. The aggregate value was $493,391,990. Double the production, and deduct one-third of the increase for increased cost, and the profit to the whole nation would be $328,927,993.

I need not pause to call your attention to the desolated and abandoned plantations, all over the southern States. Millions of the virgin soils of the western States have already been injured by exhaustive cultivation. Our people seem to be betrayed into this ruinous policy, by the facilities with which new lands can be obtained to replace the exhausted. While the average size of farms is 203 acres, as it was in 1850, this wasting system may be continued. Economy in practice keeps pace, in some measure, with density of population. Accordingly, in Belgium, where the population is 336 to the square mile, and in China, where they have nearly reached the starvation point, the necessity of self-preservation has driven the people to many of the same methods that are with us the result of scientific deduction.

The worst result of a thriftless culture is not told. Too large a proportion of the farmers of the west, and the planters of the south, owe their crops in advance. They pay the crops of this year to extinguish the debts of the last. The consequence of this fatal negligence, pecuniarily, socially, personally, nationally, I have not time to pursue. I will remind you, however, that the rural population meets a terrible retribution in the tribute paid by labor to capital, the perpetual debt, which hangs like an incubus upon their energies, of country to city, and the disproportionate share of human earnings concentrated in great cities, some of which is dedicated to noble uses, but too much of it consumed in reckless extravagance, in crime and debasing indulgences.

All that our country needs, with her vast, untested capacities, in order to exhibit the most prodigious results in agriculture that the world has yet witnessed, is knowledge, penetrating deeply, and disseminated universally among the rural population.

It cannot be denied that in times past the most moderate talents, and little intelligence, were deemed adequate for the tillage of the earth. The farm laborers of continental Europe live in the same cottages—often in mud cabins without furniture—and plod

along in the same track as their forefathers. They cling to gross superstitions, and ancestral usages, and scorn books and instruction. In many portions they persistently draw the plow with ropes tied to the horns of oxen, and generally reap their grain with the sickle. In England, the tenure of landed property, and its accumulation in few hands, the crushing burdens of Church and State, and the consequent poverty and ignorance, render farm laborers a complete tributary population. An American traveler in England, inquired of a group of farm laborors if they were prospering. "No," replied one of their number, "we are haying!" This is rather a ludicrous, but striking illustration of the ignorance of English farm laborers. In our country alone is the farmer a man, socially and politically a developed man and freeman. Whether in that loftier acceptation he will stand the test, "He is a freeman whom the truth makes free," may admit of greater doubt.

The pervading sentiment among a great portion of the farmers themselves, in regard to the dignity of their calling, and the knowledge required for its pursuit, is humiliating. Farming communities are decimated of the boys of most active intellect, sent off to city or college, to follow other pursuits more respectible in the apprehension of the family. As surely as in ancient times, feats of valor and of arms being alone the theme of song and story, and winning alike the smiles of beauty and the applause of the powerful, sifted the masses of genius, energy and courage, so in modern days the brilliancy of great fortunes, and professional renown, have attracted a large portion of its capacity and energy from the rural population. The victims are, it is true, tempted by a siren's song. Ruined health, doubtful reputation, bankruptcy, and sometimes crime, tell the sad history of regiments of infatuated men. The aspirations of few are realized, and to them life loses its zest before ambition is gratified.

Go into a public assembly, and if the speech is dull and stupid, ten to one the farmer who stands next to you, will declare that the speaker had better go back to the plow or the jack-plane, thus acknowledging that inferiority of talent is sufficient for his own noble calling.

You have throughout the State, at this season, county agricultural fairs. The cities and villages have been ransacked for orators. You have sought them among lawyers, doctors, professors and politicians. Each pursuit should furnish its own teachers—its own prophets. If, perchance, a farmer here and there has

ventured to address his brethren, to tell stern truths, in his plain and homely way, farmers will be the first to abuse him for his temerity, and pursue him with the most uncharitable criticism.

Such are some of the evidences of the degraded estimation, too often placed upon their avocation, by the farmers themselves.

If there is any pursuit which demands for its most successful prosecution acute powers of observation, comprehensive intellect, and most abundant and varied knowledge, it is that of the farmer. There is scarcely a science which will not shed a flood of light along the pathway of the farmer, and a knowledge of the practical arts and trades of life, must constantly aid and relieve him. So thickly do objects of interest and study cluster around him, that if an enthusiast, he might exhaust a lifetime on his own farm in pursuit of a single science.

The farmer deals with life. He is entrusted with the life and health of his own family. All animals upon his farm are dependent upon him. He expends his labor and skill in promotion of vegetable life. How important it is, therefore, that he possess a knowledge of animal and vegetable physiology. The farmer should be himself a fully developed and healthy man. Yet living under conditions, and in an atmosphere so much more propitious to health than the sedentary man, or the pent up inhabitant of cities, how does it happen that the average life of farmers very little exceeds the average life of men in other pursuits? The reason is evident. While the life of the citizen is abriged by effeminacy, noxious air, and contagious diseases, the life of the farmer is shortened by excessive exposures, imprudences, and a general defiance of the laws of health. A farmer should be familiar with the general laws by which all animals grow, thrive and decay. When his own family are in danger, he demands the skill of a physician, who has bestowed a great share of his life in obtaining the necessary knowledge of the human frame, and its mysterious functions. But every domesticated animal belongs to the same class of animals, mammalia, as himself, endowed with a similar, and in some cases, as delicate an organization. He should know enough at least, not to expose them to vague quackery. You have perhaps half a million of horses in the State of New York. How many are destroyed by quackery? and what loss is incurred? At least a million of dollars annually. So important does the French government consider this subject, that it supports three great Veterinary colleges. They are resorted to by students from all France, and two hundred and forty scholarships

are distributed at the government expense, sixty-eight at large, and two to each of the eighty-six departments of France.

I should not expect every farmer to be a physician, but how invaluable to him, often living in an isolated position, would be a mastery of the general principles on which the preservation of health depends. I need not say how many thousand victims could be rescued from gross superstition, or the vilest quackery.

The farmer's principal vocation is to deal with vegetable life. The assumption is that he knows all about it, when in fact he knows very little. The laws by which a single stalk of corn is sustained, and grows, are as inscrutable as those by which Uranus is whirled in its vast orbit—yes, more, because the elements, the rapidity, the course of the planet's motion, are comprehended, while the laws of the growth of the tiniest plant are not. We plow, drain and pulverize the soil, and plant the seed, and nurse it. It grapples its hundred rootlets widely in the soil, and throws out its branches to gather food from the air, the rains and the dews. It thrives vigorously, and pushes out stronger roots—the atmosphere and the soil reciprocating the aids which each affords the other. The farmer cultivates the plant, and destroys all rival vegetation likely to exhaust or choke it. But his appliances are mechanical. His knowledge is arrested on the very threshold we desire to cross. The mysterious agencies by which the plant is invigorated, and by which it converts into grain, fruit and vegetables, its invisible and intangible food, are beyond his control. An endless field for scientific research is here opened.

Botany will constantly illustrate the pursuit of the farmer. I need only call your attention to the subject of hybridization of plants, by which new varieties are multiplied. The display of flowers, so multiform and gorgeous, and those lengthened benches, groaning under huge piles of vegetables brought to such perfection, attest how much our gardens, parlors and tables, owe to science in this department. Here is an instance where research, purely scientific, has often doubled the value of the earnings of the farmer or gardener. What do croakers against books and science do with such a fact?

Horticulture can hardly be pursued without a knowledge of this subject. Farmers in general treat the subject of horticulture with too much contempt. Nothing throws around the homestead so many attractions as the orchard and garden. Even to the common subject of grafting and budding, a great majority of farmers have paid little attention. The pomologists here will tell

you that they have been frequently asked to-day for specimens of cultivated fruit, for propagation of the same kinds, from the pit or seed. This seems incredible, but so it is. Practical men have laughed over the story of the college educated gentleman who lost a shoe off his horse and carried a skillet handle to the blacksmith to repair it with. Yet he exhibited no greater ignorance than the man who would attempt to raise cultivated fruit from the seed or pit.

Chemistry perhaps, of all the sciences, is that which will aid the farmer most. Its analysis will show the constituent parts of animal and vegetable matter; it will eliminate from the fibrous the nutritive portions; it will prove which are the most profitable, and in many cases, which are the most healthy productions; it will compare different grains, and tell you the relative portions of gluten, starch, oil, sugar, albumen, water, potash, lime, &c., contained by each; it will disclose which grain possesses most of the elements conducive to vital heat to the animal, which contains the most fattening material, and which will build up fastest the muscular system.

Chemistry will also show the imperative necessity of saving everything of an animal or vegetable nature, and indicate the most economical and sure methods of preservation. The sterilization of land is owing to the fact, that organic matter is sold in the crop, burned, evaporated, or whirled away in the running stream. I doubt not, there are daily thrown into the streets of the city, or into the canal, such quantities of organic matter, in process of decomposition, as would fertilize thousands and tens of thousands of acres of land. Chemistry will teach you how it can be composted and preserved, and its volatile and offensive elements arrested, deodorized, packed away for future uses. Within the State of New York, untold amounts of wealth are annually wasted for want of a little knowledge of chemistry. Almost every locality contains vegetable deposits, or lime, or marl, or some renovating element. The barn-yard manure, liquid and solid; the offal of the house, vegetable or animal, composted with muck or peat; the volatile elements, held captive by cheap substances for which they have affinity, and the mass preserved till it is thoroughly decayed and assimilated, would preserve any farm in a state of productiveness, that would be otherwise soon exhausted. Most estates possess within themselves the elements sufficient to keep them in perpetual fertility. How many millions of dollars would have been saved to the State of New York,

had the farmers of the past generation known, appreciated and profited by this great, vital and fundamental law, that all animal and vegetable matter taken from the soil, or its equivalent, must be restored to it, or certain ruin commences.

I know that it is somewhat the fashion to decry agricultural chemistry, because its analyses of soils have not proved entirely satisfactory. But if chemistry never analyzed a shovel full of soil, its services would be invaluable in the provinces named. When chemistry takes the mineral coal or the medicinal spring, upon a farmer's land, and tells him unerringly the component parts and value; when it takes his food and the food of his cattle, and tells him what nutriment it contains; when it exposes every adulteration of food, or liquids, or drugs, in which commerce deals; when it detects poison and arrests crime; when it carries its lamp among the miners in the bowels of the earth, and there holds guardianship over human life itself, and we recollect that these acts are but types of its mysterious agency, it ill becomes us to wrest from it its scales, its crucibles, and its re-agents, when they are applied to the earth, on whose productions teeming millions of men and myriads of animals subsist, to compel her to yield up more of her secrets for amelioration of the condition of the race. When Franklin drew down the lightning with his kite, the skeptics of those days doubtless derided his experiments as futile and dangerous; yet the last reverberations of the cannon have hardly died upon the ear, the last flickering blaze of the bonfires have hardly expired, that celebrated the most important achievement of man since the discovery of this continent by Columbus, of which Franklin's experiment was the germ. Let us not discourage science from delving into the earth, if such are the prolific results of her researches elsewhere.

Geology would constantly aid the farmer in a knowledge of the composition of soils. But the bearings of this science upon culture, open too wide a field for discussion. There can be nothing so startling in romance, or instructive in story, as the mutations of the earth through its geological epochs, till it finally became suitable for the habitation of man.

Mineralogy, Meteorology, Natural History, are all subsidiary to the pursuits of the farmer.

The study of Entomology, with the aid of the microscope, is destined to prove of great value to Agriculture. Every leaf, every animal, is covered with parasites. Insect life crawls and flies everywhere; it is visible and invisible; it is a protective

sentinel, or a destructive pest. Some insects live by the destruction of our crops. Some are predatory, and live on insects, or the eggs of insects, most noxious to man. Each crop, each fruit, has its peculiar enemies in infinite variety. No revelations can be more beautiful, and at the same time more valuable, than those of the microscope. The functions, habits and food of insects are important subjects of investigation. The State appropriation to promote the investigations of Dr. Fitch, the Entomologist of this Society, was therefore an enlightened and judicious act. The most terrible scourge ever known to the wheat crop, the midge, is now committing its ravages over the continent. Your able and efficient secretary estimated the loss by its ravages in 1854, in the State of New York alone, at fifteen millions of dollars. It has carried its wide devastation over the wheat zone to the Mississippi. The habits of this insect are partially understood. How and when it deposits its eggs, how it is hatched and fed on the tender kernels of wheat as a grub, how it falls to the earth and burrows till the following year, how it is warmed into life and emerges a winged insect just when the wheat is in the milk, and deposits its eggs again—so much is known, but in all attempts to arrest or destroy it, we are baffled. He would be ranked among the benefactors of mankind, who should discover how to arrest or destroy it. How often does the farmer boast that he knows all about farming, and asks nothing of science. Yet here is a minute insect, not one-tenth of an inch in length, that contests with proud man his right to the most important article of human food, and wrests it from him. Man may arrogate omniscience in his calling, but he cannot cope with this insignificant midge.

The more extended knowledge a farmer possesses of mathematics, the more ready he is for emergencies in his private business, and the more useful he proves as a citizen. He need not be a profound mathematician. He may not be able to calculate the orbit of the comet, now visible in our firmament, but no day escapes when a knowledge of surveying, leveling, gauging, and of measuring solids and areas generally, would not be valuable. That intuitive aptness in the application of mechanical powers, which enables some men to avail themselves skillfully and at once of machinery, is possessed by few. Precise mathematical knowledge is required by most minds for its comprehension. Even in the elementary branch of arithmetic, the farmer who is most prompt and rapid in the application of his knowledge, is the most useful citizen in his vicinity.

A thorough knowledge of the Constitution of the United States, and his own State, should be acquired by every good citizen in early life. So should he be able to draught common legal instruments. A member of the Senate of a neighboring State, himself a practical farmer, informed me that he was the only man within six miles of him, not a professional man, who could draught a legal instrument. A knowledge of book-keeping and accounts is as necessary, and should be deemed as indispensable to any farmer who has business to transact, as the capacity to raise the crops in which he deals.

I think I have said enough to prove that every art and every science may conspire to increase his enjoyments and profits, and confer dignity and grace upon the tiller of the soil. It is the ART of ARTS, the SCIENCE of SCIENCES, where physical and intellectual capacity, judgment, taste and learning may aid to produce the most triumphant success. It is an erroneous, a contemptible idea, that the highest degree of education cannot be employed in one calling as well as another. Indeed I can conceive of no life, that followed in its comprehensive spirit and grasp, would call more varied powers and acquisitions into action, inspire more of the faculties and energies of man, and test his ingenuity more frequently, than the life of a farmer. The application of Science to Agriculture has just begun, and is destined to produce wonderful changes in the production of food and clothing for man. While his profession is liberal, and his sphere of inquiry wide, while his pursuit is calculated to produce harmonious development of mind and body, and continuous health, this ever buoyant, ever cheering, ever glorious reflection must dwell upon the mind of the tiller of the soil, that he helps to create his own support, and clothe and feed his brother men, instead of consuming their substance. In witnessing the development of the crop, from the germination of the seed till his golden harvests are housed, he need not have perpetrated a wrong. No reckless experiment on life or property, no compromise with perjury or crime, no trickery nor fraud, nor extortion, nor usury, need creep in to poison the gratification with which he can proudly smile upon his conquests.

And now arises the question: Are facilities for sufficient education within reach of the youth of the rural population? It is a vital question, not for you, not for this State only, but for our common country and the age.

The whole population of the State of New York, in 1850, was 3,097,394. Of this number, about 16 per cent were between the

ages of sixteen and twenty-two, or nearly 500,000. Of these, rather more than one-half were females, leaving, however, nearly 250,000 young men. There were only 2,673 enrolled in all the colleges of the State. Allow four times, six times, yea, nearly nine times as many to enjoy good advantages of education in advanced schools and academies, making the whole number 25,000, and then allow for the class so irremediably stupid that they will not seek and could not profit perhaps by education, and for those who possess such vitality and energy of mind as to overleap all barriers and drink in education, as they live and move—25,000 more—and you still have 200,000 of the young men of New York, deprived of all education beyond that which the meager common school affords. It may be said that a large proportion of these youth, in such a state as this, reside in cities and towns. Very well! It only changes the argument, and proves the necessity of Industrial as well as Agricultural Colleges for your communities. We have, or soon shall have, in Michigan, 50,000 young men, almost entirely among the rural population, destitute of means of aquiring such education as their age and calling imperatively demand. I omit mention of females, because unnecessary to my argument. Female education of an equally elevated character must keep pace, however, with that of the male population.

Do existing educational institutions afford relief? School officers will admit that the common schools, in the main reputable, are often a mere farce. Thousands of the young throw up their books in despair, because they have outstripped their instructors, and forego all further advantages of instruction.

The great *desideratum*, the great need is, a chance for the boy to aid himself. While at the common school, the boy works upon his father's farm. He earns his education as he proceeds. Labor is there honorable, but he can use his physical system to improve his brain in no wider sphere. Tens of thousands crave the chance to labor three or four hours per day, supporting themselves while improving their minds, but no opportunities are afforded. It may be said that high schools and academies are accessible, but it is obvious that expense and distance render them unavailable to the mass.

Those who resort to the higher colleges, even to pursue a scientific course of study, become enervated, or at least indifferent to physical toil, and going there at an age when they are most impressible, they are borne along in the irresistible current

of opinions and sympathies prevailing there, and not one in fifty becomes a cultivator of the soil. Double, treble, quadruple, the accommodations of existing universities, and they could receive but a mere fraction of the youth clamoring for education, if any suitable facilities were allowed them to help themselves.

A new order of institutions has therefore become an absolute necessity, where a student can, in part, at least, educate himself, where his physical faculties are preserved in their full vigor and elasticity, and where those studies which are most useful to a cultivator of the soil shall be embraced, whilst those which are least valuable shall be discarded. To remedy this yawning deficiency, Agricultural and Industrial Colleges are organized in several of the States, and initiatory steps are taken in other States to establish them.

The Agricultural College of the State of Michigan has been in actual operation since May 13th, 1857. Its Faculty consists of a President and four Professors, and it has accommodations at present for one hundred students. It was created in obedience to a requisition of the revised Constitution of 1850, and organized under a law of 1855. The farm consists of 676 acres. Its design is to unite physical with mental culture, to afford the student a chance to earn, in part, his own education, and a chance to apply himself, free of tuition, to those sciences and practical arts that may render him a scientific farmer and an enlightened citizen. The effort has attracted anxious attention throughout the Union. Applications from other States and Canada have been made, sufficient to fill the institution. This is the first State institution, and the only exclusively agricultural one yet in operation on this side of the Atlantic.

The New York State Agricultural College was incorporated in 1853. Its creation was principally due to the energy and public spirit of the late lamented John Delafield, who was chosen its first President. After his death the work was suspended; it was revived in 1856. The farm, embracing 686 acres, was then purchased at a cost of $45,000, principally by subscriptions of the farmers of Seneca county. It is situated on an eligible and commanding position, stretching from the village of Ovid to Seneca lake. A loan by the State of $40,000, for twenty years, without interest, is secured on 400 acres of the estate. Instruction in those sciences and arts, calculated to enlighten the farmer and illustrate his calling, is to be combined in its system of education. The trustees have contracted for the erection of a portion of the

main college building, to be completed in one year, for the accommodation of 125 to 150 students. Its available funds for the purpose now consist of $35,000, not so much as the cost of a single school house in many of your towns—a sum in sad contrast with the ostentatious exhibit around us of the agricultural capacities and wealth of your Empire State.

The Peoples' College, at Havana, Schuyler county, in this State, was incorporated in 1853, and organized in 1857. Its charter contemplates a capital of $250,000, which may be increased to $500,000, of which enough has been already subscribed to encourage the belief that the experiment will be fairly tested. The corner stone of the main edifice was laid on the 2d day of September last, and the trustees announce their intention of opening the institution within one year from this time. It should perhaps be designated as an Industrial, rather than an Agricultural, College, for it embraces various kinds of manual labor in its plan, while the farm consists of but 200 acres of land. Labor is to be compulsory on both teacher and student, a plan, if successful, admirably adapted to prepare a new class of professors, such as new institutions of the age will demand. It contemplates a wide range of study no less, in the language of its charter, than "Literature, Science, Arts, and Agriculture."

The Farmers' High School of Pennsylvania, was incorporated in 1855. It is located nine miles southwest of Bellefonte, in Center county, very near the center of the State, on 200 acres of land, the munificent gift of Gen. James Irvin. The farm, to which 200 acres have been added by purchase, is being brought rapidly into a high state of cultivation. Its resources consist of $10,000, donated by the State Agricultural Society, $10,000 subscribed by the citizens of Center county; $5,000, a bequest of Elliot Cresson, and $25,000 appropriated by the State; the further sum of $25,000 has been appropriated by the State, on condition that an equal sum be subscribed by citizens. Its whole means, therefore, if the subscription is completed, of which no doubt remains, are $100,000, and the farm donated by Gen. Irvin, estimated at $12,000. One wing of the main college building is nearly erected, and the present design of the trustees is to open the institution on the 15th of February next, with one hundred students, to be increased to four hundred.

The Maryland Agricultural College was incorporated by the State in 1856, and $6,000 per annum appropriated towards its support, provided subscriptions to the amount of $50,000 were first secured. That object having been effected during the last

winter, the institution was organized and the college located on a tract of 428 acres of land, purchased at Bladensburg, near Washington, from the estate of Hon. C. B. Calvert, the largest stockholder, and President of the Board of Trustees. The corner stone of an extensive edifice was laid on the 24th of August last, and the design is to push the work to rapid conclusion. Its educational plan proposes the development of the whole man—moral, physical, and intellectual.

The State Agricultural College of Iowa, was incorporated in March last. The preliminary appropriations are $10,000, and five sections of very valuable lands heretofore granted by Congress for erection of Capitol buildings. Localities vie with each other in offers of money or land to secure its location, varying in value from $10,000 to $25,000. It is to be fully organized, and located in January next.

The Minnesota Agricultural College was incorporated during the present year. It is located at Glencoe, McLeod county. The farm consists at present of 320 acres of land. Its design, scope, and principal features, as well as those of the Iowa College, closely resemble those of the Agricultural College of Michigan.

The Agricultural Colleges of Michigan, Iowa, and Minnesota, are State institutions. Those of New York, Pennsylvania, and Maryland, are the joint works of public spirited individuals and the respective States.

In anticipation of all these efforts, the Farmers' College, near Cincinnati, Ohio, under the auspices of F. G. Cary, Esq., and other public spirited gentlemen, has for several years promoted the cultivation of the earth, in conjunction with literary and scientific pursuits. It is, however, a classical institution, embracing other objects, and prescribed labor in the culture of the soil is not a compulsory feature of its plan.

A bill, establishing an Agricultural College, is now pending before the Legislature of Ohio, and will probably be reached at its adjourned session the approaching winter. Its friends are not sanguine of its success. Whether it passes or not, the farmers of Ohio have 150,000 sons deprived of all possible means of education beyond the common school.

The Legislature of Massachusetts, in 1856, incorporated a School of Agriculture, which must be dependent entirely on subscriptions for its future establishment. In 1850, Massachusetts, in advance of other States, appointed Commissioners to investigate the subject, and Prof. Hitchcock made an elaborate report

relative to Agricultural Colleges in Europe. A plan was recommended for agricultural education, but no effective action was taken on the subject. Two citizens of Massachusetts, Benjamin Bussey, of Roxbury, and Oliver Smith, of Hatfield, have made princely bequests to be used in some remote future contingencies for founding agricultural colleges, but available for no immediate use.

Efforts are being made to establish agricultural colleges also in Virginia, South Carolina, Alabama and Wisconsin.

Agricultural professorships have been endowed in the Universities of Virginia and Georgia by public spirited individuals, and also exist in several other of the classical colleges of the country. In Michigan, the university has such a professorship. Scientific schools, of an elevated character, have been connected with many of the older institutions. These will be merged in the several institutions with which they are allied. Superior facilities will be thus afforded for a man already educated to acquire a better knowledge of agriculture, as an accomplishment, but very little is thus effected towards filling a deplorable hiatus in our educational systems.

It will be perceived that the enterprises in this country, designed to meet the great necessity, are all in embryo. They are the initial attempts to satisfy an irresistible craving for an additional means of education. In Europe, however, agricultural and industrial colleges are no longer an experiment. The neglect of our government stands in woful contrast to the paternal care exercised by the governments of Europe. We have no department of agriculture, not even a bureau of a department. Our government may expend in ten years, on the whole subject of agriculture, as much as it would cost to build a first class steam frigate to sail around the world on pleasure excursions, or rot in the docks. The Senate, during the last Congress, abolished its committee on agriculture, and thus before the world, ignored the subject. In France the subject is under the charge of the Minister of Agriculture, Commerce and Public Works; in Prussia a Board of Rural Economy, subordinated to the Minisister of Agriculture, has control of the subject; in Russia, it is under the supervision of the Minister of Public Domains. The other nations of Europe generally take the subject under governmental patronage and custody.

In Prussia, agricultural education is perhaps best systemized, Prussia has 413 agricultural societies of different grades, all of

which are affiliated together, and are subordinate to and report to the Board of Rural Economy. In all Germany there are one thousand more such societies. Prussia supports fifty-one agricultural periodicals. In all Germany there are eighty-nine such periodicals. Societies and periodicals, as well as schools, are devoted to special objects, bestowing their whole attention to perfecting some single branch of culture. Prussia has five agricultural colleges of a high order, twenty-eight elementary colleges, and fifty-seven special schools for affording instruction in horticulture, flax culture, sheep raising, &c., and seventy-two model and experimental farms. But the supervisory functions of the government do not end here. It aids in the dissemination of the best seeds and best machinery for flax culture; it distributes cuttings and seeds of the mulberry, and reeling and other machinery to promote silk culture; it promotes pomological culture in the same efficient manner. So it encourages the propagation of the breeds of horses. Draining engineers are detached to different parts of the kingdom to instruct the people, indicate the proper channels for drainage, and systematize it in the most economical manner. Lessened annual expense of the public roads, improved general health, and increased production of the kingdom, are the ample remunerations to the government.

In France there is an Agronomic Institute on a portion of the premises of the Palace of Versailles. There are three Imperial Colleges of Agriculture of a superior kind. There are eighty-six lesser schools, one in each of the departments. There are also Polytechnic and Industrial schools of a somewhat kindred nature. To the three National Veterinary Colleges, I have already alluded.

Russia appreciates the importance of stimulating agriculture as the sure foundation of her prosperity and colossal power. Her efforts are comprehensive and vigorous. The government supplies land for various tests and experiments. Importation of implements free of duty has been allowed. Fairs are held in districts of the empire, and statistics are published at the public expense. Periodicals are published and gratuitously distributed, particularly among the clergy, that they may become missionaries of agriculture as well as of the Gospel. Special schools are established for rearing of horses and sheep, for culture of flax, silk, &c., and for the study of epidemics among cattle. A garden of an hundred acres was established fifty years ago near Odessa, on the Black sea, for the acclimation of seeds, fruits and plants

of southern Europe, and subsequently ten other gardens for similar purposes. Agents are dispatched not only over the empire, but to foreign countries, to obtain information and improvements for dissemination. There is one Imperial College at Gory Goretzk, and eight other colleges are established in different districts of the empire, all well endowed, and each possessing an extensive model farm, the least of which is fifteen hundred acres. In addition to these are numerous farm schools. A Technological Institute for education of mechanics, chemists and engineers, is also established. Graduates of the higher institutions have been sent abroad to be better fitted for professors at home. The students in the eight principal colleges are educated entirely at the public expense, and when they graduate are supplied gratuitously with books, seeds and tools; yea more, the most meritorious are supplied with farms near their native villages, as rewards for their proficiency. An intelligent Russian informed me that if the schools of Russia had done no other service than the eradication of superstitions and prejudices, their cost was well repaid.

Great Britain has established a system of agricultural schools for Ireland, but not for the rest of the empire. The principal agricultural college in England is at Cirencester. It is designed for the gentry only, and is an expensive institution. The question may be asked: Why has England, the foremost country in agriculture, the fewest schools? The reason is obvious. The landlord, the steward, the man of science, and the tenant farmer who employs the laborers, confer together on all proposed improvements. The landlord has the authority and the capital to execute their resolves. *They* are the agricultural college. Thus science, capital and skill are called into requisition; hence the island presents a scene of unrivaled rural beauty, and groans under her abundant productions.

Austria, Saxony, Bavaria, Sweden, Wurtemberg, Belgium, and other nations of Europe, earnestly promote agricultural education.

The first institution of the kind in Europe was at Hofwyl, in Switzerland, founded by Fellenburg, a name illustrious in the annals of education. The model school, perhaps, of all Europe, is that of Hohenheim, in Wurtemberg. The other most remarkable colleges are Cirencester in England, Grignon in France, Moglin in Prussia, and Gory Goretzk in Russia. In 1850, Prof. Hitchcock enumerated three hundred and fifty-two agricultural institutions

in Europe, but he omitted those of Sweden and some other countries. They have been greatly multiplied since that time. I think there are now five hundred colleges, schools and model farms in Europe, mostly the creation of the last twenty years. Their success is no longer in controversy. Neither prejudice nor ignorance is allowed to crush them. They are regarded as a great and beneficent agency, which governments, in the exercise of a benignant guardianship, are bound to exert in increasing the productions of the earth and promoting the welfare of the race. They appreciate the great fact that the surest way to promote the posperity of the State is to enlighten the individual and multiply his energies. I can only make an approximate estimate but there are probably employed in all the schools of Europe at the present time two thousand professors and teachers, and fifty thousand students are in attendance upon them.

I have said nothing relative to the courses of studies, the discipline, or the plans on which the European schools are conducted. It is sufficient to say that the design of them all is a mastery of the physical sciences and practical arts that bear upon agriculture, and the harmonious union of study with labor. Their institutions, however, furnish no models for us. The lower order of schools in Ireland and Russia are for the peasantry, and of a grade not elevated enough to prove useful in this country. The best of their colleges are designed for the education of stewards, agents and teachers, and not for proprietors who labor with their own hands, and who combine, like our countrymen, all the characteristics of landlord, tenant and laborer in the same man.

The objections to such institutions in this country will be numerous, in spite of the necessity for them. The first question asked is, "Do you expect to liberally educate the whole mass?" That is impossible. But a large proportion, ten times as many as now are, can be highly educated. Large numbers can be rendered intelligent citizens, capable of performing all their several duties, and lingering prejudices can be eradicated from their minds.

The assumption will be made that if we need one school we need an hundred. That is true. But they are novel—they must be built up gradually. No sufficient teachers can be obtained. I doubt whether instruction could be had for ten colleges in the whole State of New York. No plans can be thoroughly successful till a new race of men are educated in these very colleges, for professors and teachers.

The general objection urged with a singular dogmatism is, that labor and study are incompatible. It is not so in tender boyhood, where the boy actually performs drudgeries while mastering the rudiments. It is not so in mature manhood, where hundreds of men not only labor but support families, and acquire funds of knowledge while engaged in manual toil. There is a Senator in the Congress of the United States, who was taught to read and write after he was of age, and after he was married. George Stephenson, the great English engineer, began his career as a breakman, married young, and made nearly all of his mental acquisitions while pressed down by crushing labors. Indeed, courage, thought, labor and study, severe and unremitting, are the only conditions of lofty success to the mature man. Why then this assumption, that labor and study are incompatible just at the very period of life when the body is most vigorous, and the mind most free from anxiety? It originates in a diseased public opinion. It continues to exist, because no philosophical plan of combining labor and study has had a fair trial.

It is true that Manual Labor Schools have generally been unsuccessful. The cause is evident. They have often withered under the frowns and incredulity of the public. Often the labor selected has been confining and fatiguing toil, by no tie connected with any pursuit in which the heart was enlisted. Often too, labor has been elective, one portion of the students working, while others were exempt. Castes were inevitable from such incongruity, and the death of such an institution was almost coeval with its inauguration.

The institution in Michigan has been in operation about eighteen months. Labor is there compulsory on all. So far all the labor has been cheerfully performed. Opinion among themselves has a powerful influence in holding each student to a manly performance of all his duties. Generally those who are most faithful in study are foremost in their sports, and foremost in their work also. So, too, fidelity does not depend upon the fact whether a young man comes from town or country, but upon his energy and intrinsic manliness. There is no shrinking from duties, even those which are most offensive and most severe. The farm was located in a forest. Lands have been reclaimed by the students, such as are generally neglected as irreclaimable. For eight months—except students and those in official positions—but a single man, and he the porter of the kitchen, has been regularly employed on the estate. All the repairs in wood are

done by the students; clearing and ditching, planting and harvesting have been done by the students; all the teams and stock are in daily charge of the students; a bridge has been laid out and erected by the students. Circumstances, a short time since, deprived us of every person employed in the culinary department. With the aid of three or four persons, the students performed all the duties connected with that department for more than a fortnight. Had the institution been deprived of all external aid, the meals would have been well prepared, and punctual as usual, and the spectacle would have been presented, of a college of students and professors, entirely self-reliant and independent. So far, this is compatibility of labor with study. I recently saw an assnmption in a public paper, that if thirty institutions were started for the purpose, and the compatibility of labor and study was established in a single one of them, success would be a full remuneration for the cost of the whole. I would not assume that it is proved in Michigan, but I assume that in spite of most formidable obstacles, it is rapidly being demonstrated.

The institution has met with trials and misfortunes. It should have been located on land thoroughly subdued, already a model farm. An experiment sure to encounter the numberless difficulties inevitable to all new enterprises, and sure to incur malignant opposition from without, should have been placed where all the labor could be made at once interesting and attractive. As it is, the institution is compelled to suffer all the risks, toils, trials, and the diseases, this year sweeping and afflictive, of a new country, such as break down the constitutions, crush the spirits and abridge or destroy the lives of the first generation of pioneers. It may therefore yet fail, and prove a disastrous experiment; but the philosophy of the plan, in many vital points, is no less vindicated.

Another fact is already established in the institution, that the student makes more rapid intellectual progress than though he performed no labor at all. The invigoration of body reacts upon the mind, inspiring it with new power. This should be, and proves to be, a natural necessity.

It has been urged against such institutions, that they will be mere receptacles of the sons of the rich, sent there to become familiarized with labor and the use of tools. The exact reverse is the primary design. The chief object to be kept in view, is to enlighten the toiler with the truths of science, that the man who

works with the hands may think with the brain. In our experience the very class who were destitute of early advantages have sought the institution most eagerly, and best appreciated its advantages. A system of labor has been harmonized with a system of study. The students are credited with their labor three hours per day, and assessed with their board at cost. The balances are struck each term, and inconsiderable as these balances are, many students have been compelled to leave, and abandon further hope of education, because unable to pay them.

We have discovered that great benefits result from attrition and constant discussion among the students. The farmer employed on the estate, before he had been there six months, declared that he would not part with the knowledge he had obtained for a thousand dollars. The continual exercise of mind and comparison of opinions, has disclosed to him the nature of the fatal blunders which young farmers commit, and taught him how they might be shunned.

The assumption is made that a man can learn nothing practical in such a school. That depends upon the discipline. Our experience is, that acquisitions are very rapid in this respect; but allow that a young man learned little in mere handicraft, the collateral education will far more than repay the cost. His superior English education, his improved physical capacities, his superior knowledge in regard to food for his family and his stock, and the preservation of health, his general readiness and capacity in mastering business, and executing public trust—all these acquirements are invaluable, and cannot be earned by the exercise of his own faculties in any existing institution.

I met a man last year who exultingly declared that there was but one way to hoe, but one way to plow, but one way to harvest, and books and schools were therefore futile. Fifty years ago, when the traveler was seven or eight days in making a voyage from New York to Albany, in a crazy sloop, there was but one way to travel. Before Arkwright's spinning jenny, there was but one way to spin. Before Professor Maury published his Theory of Winds and Currents, there was but one way to sail. The voyage from New York to San Francisco, which would formerly have taken six or seven months, has been performed in less than ninety days. Twenty years ago there was but one way to communicate with London,—it took three months. The practicability is now proved of dispatching a message from London after breakfast and have it arrive in New York before daylight. If there is but one way

to farm it, that is a very poor way, which affords an average crop of less than eleven bushels of wheat per acre over such a country as we possess.

This same friend called my attention to a Pennsylvania German, who could hardly read and write, and had a great contempt for papers and books on farming, but was the best farmer in his neighborhood. I told him that I thought this basket would not hold water, and that this model farmer owed every thing to the spirit of improvement abroad. His plow was a Troy plow, instead of the old shaky implement, with wooden mold board sheathed with iron, with straight handles tipped with cow-horns, which he used when a boy; his implements were mostly light, graceful, elastic ones, of recent patterns; his fruit was budded and grafted from such as his neighbors had imported from the best nurseries. Whatever superior cattle, or sheep, or swine he had, were obtained from neighbors at no extra cost. The nails he shingled his house with cost but one-third as much as those which his father used. When he got up in the morning, he lighted his fire in a second with a friction match, instead of tugging ten minutes with flint and steel and tinder box, and he complacently composed himself to sleep at night under sheeting that cost eight cents per yard, as good as that which cost fifty cents when he was a child. The story is told of Plato, that having described man to be a biped without feathers, Diogenes, the cynic, laid a plucked rooster before him and exclaimed, "Behold Plato's man!" If our model farmer was deprived of all the benefits he had derived from that progress which he despised, if he was stripped of all borrowed plumes, he would be as innocent of feathers as Plato's man.

It is objected that graduates will come forth from such colleges crammed with all sorts of visionary notions and theories. The design is to effect the contrary result. It is to teach men to subordinate experience, and books, and speculations, to great natural laws; to learn and acquire the tests by which truth can be sifted from error. Let me illustrate. You will hear men, even at this day, defend the custom of wintering animals under severe exposures, rather than stabling them. It is an established natural law, that vital heat is created by contact of the carbon of the food with the oxygen of the air, existing in the system or inhaled into the lungs, and that the more heat is demanded by exposure, the more waste of the animal, and the more ravenous consumption of food. Natural law, then, as well as economy and humanity, enjoins that cattle should be wintered in clean, comfortable, well

ventilated buildings. Experience and argument weigh nothing against a natural law.

But I cannot follow these objections further. The earth revolves in its orbit, in obedience to law; the stone I throw into the air, falls in obedience to law; the circulation of the blood, and the operation of the human functions, are governed by law; everything blooms and decays on the surface of the earth, in obedience to immutable laws. It is the province of science to discover and elucidate those laws; it should be the province of agricultural education to master and enforce them. The work before us is a great and significant movement; it may affect the welfare of millions. All that is anticipated by sanguine men may not be realized. Something may be done to substitute intelligence for ignorance, energy for luck, health for disease, and science for chance.

Institutions of the kind may fail; I think many of them will fail. I understand that your own institution, yet in its infancy, has been subject to calumnies and criticism, calculated to benumb public sympathy, and paralyze the energies of its friends. There will always be narrow-minded men, who will gloat over every misfortune, every mistake, and every failure. Nothing short of inspiration will save men from error. But should an hundred institutions fail, there yet stand your two hundred thousand young men in New York, and eight or ten times as many in the whole Union, panting for education. There they remain, with minds to educate, and physical capacities adequate to earning an education, if chances were afforded. No facilities will be provided for meeting a recognized demand of the age. When I say all this, I do not mean to decry the common school nor the university. "To the end that learning may not perish in the graves of our forefathers, be it ordained that a Free School shall be maintained by every fifty families." Such was that early and significant ordinance of the Pilgrim Fathers, which has performed so invaluable an agency in the promotion of civilization. I was born almost within hearing of the wintry surges that beat upon Plymouth Rock. I was educated in one of the most venerable institutions of New England, where I could look out from my window, and see that majestic shaft rising upon Bunker Hill, a perpetual monument to the intelligence, as well as the valor and patriotism, of our forefathers; and I shall never cease to appreciate and defend all those institutions of learning which I was taught to cherish around those hallowed spots. But another, and an additional

agency, is now demanded for the education of the *new man*, whom our political condition has created, in the use and conversion of the new modern physical sciences, to the highest purposes of progress and civilization—a range of study not possible, and never contemplated when the existing university was developed.

But it is no holiday business to establish such an institution as I have foreshadowed. The farm, buildings, laboratory, library, museums, stock, and implements, must cost a large sum. It must be carried forward as an important public object, and enlist general sympathy and support. What shall be the chief features of such institutions, what their matured organization, and what the most eligible course of studies, time must determine. It is with diffidence, therefore, that I give a mere skeleton.

Students for admission should pass a good examination in the branches taught in the best common schools.

The course of study should extend over a period of four years at least. It should embrace a mastery of the English language, Mathematics, Civil Engineering, Chemistry, Animal and Vegetable Physiology, Entomology, Botany, Geology, Mineralogy, Meteorology, the Veterinary Art, Horticulture, Political Economy, Constitutional Law, Book-keeping, and the Application of Science to the Mechanic Arts.

Testimonials or diplomas should be given to those who pursue a full course.

Tuition should be free to all, except to those who do not intend to pursue the life of a farmer, or who enter to remain for a limited period.

The farm should be in as complete a state of preparation for use as the lodging rooms, books, laboratory, or black board.

The first institution in a State should have a full corps of Professors, and the instruction given should be comprehensive and thorough.

Institutions should be endowed on a permanent and independent basis, that they may be "good enough for the richest, and cheap enough for the poorest."

Impressed with the necessity of more liberal aid than private individuals or capricious State Legislatures would be likely to afford, and feeling that in their infancy they must be independent of popular prejudice or bigoted opposition, earnest friends have looked with confidence to the general government for adequate grants of the public domain for endowments. It seemed fit that institutions, the success of which must enure to the national

benefit, should be a subject of national encouragement. Accordingly, the bill introduced by Mr. Morrill, of Vermont, and sustained by an impregnable array of facts and argument, in a speech delivered by him, and in Mr. Walbridge's report from the minority of the committee on public lands, passed the House of Representatives, at the last session, by a majority of five votes. Seven members of the House from the State of New York voted against it. It now awaits the action of the Senate at the approaching session. The bill proposes to grant to the several States, "for the benefit of Agriculture and the Mechanic Arts," twenty thousand acres of land for each Senator and Representative to which each State is entitled. Ten per cent of the grant can be used for the purchase of farms, but none of it can be converted to the erection of buildings. By reference to the latest report of the General Land Office, it appears that we recently possessed 1,088,792,498 acres of unsold public domain. The grant proposed by the bill in question does not amount to two-thirds of one per cent. Can any one doubt that our great landed inheritance would be enhanced in value ten times that per centage, by the creation of a cordon of colleges throughout the States, where those studies are taught which conspire to render men more enlightened tillers of the soil? From a report in 1854, it appears that an aggregate of 4,060,704 acres of land had been granted to fifteen States of the Union, for the endowment of universities. More than 60,000,000 of acres have been appropriated to the establishment of common schools. It seems to have become the unquestioned policy of the government to set apart a portion of the public lands as a sacred fund for the education of men, who, and whose posterity, are to inhabit them. Surely, if it is a legitimate use of the lands to devote them to the promotion of professional and classical learning, for still more powerful reasons, justice and expediency demand a share of them for instruction of men in those sciences and arts which bear directly upon industrial, and especially agricultural pursuits. We support two national schools, for instruction of men in the arts of destruction. Let something be done for the support of schools for instruction in the arts of production. Public sentiment seems so irresistible in favor of this measure, that we may rationally hope for its success, and the consequent liberal endowment of one Industrial or Agricultural College at least in each of the States of the Union.

Farmers of New York! I trust you will return to your homes impressed deeply with the lessons which this great exhibition of

science, industry and skill conveys. It is a great law pervading all life, that like produces like. Let every farmer be stimulated to improve all around him. Let him have the best horses and the best cattle, the best sheep and the best swine, the best wheat and the best corn, the best fruit and the best vegetables, and the best implements of every kind. Retain the best and live upon it. Sell the poorest—possess nothing which is too good for your own family. Let your homes be the homes of taste as well as the homes of abundance. Plant the orchard that it may rain its abundance at your feet. Let the fragrance of flowers fill the air about your dwellings, and the vine clamber and twine around your doorways. Push away the dingy curtains that hang like a pall over the windows, and throw open that somber parlor, heretofore used only for weddings and funerals. When the wintry storms begin to rage without, kindle the blazing fire, and let its cheerful glow encourage social intercourse. If addicted to the use of tobacco and strong drinks, abandon them. The money saved in five years would carpet your houses, crowd your shelves with choice books, and adorn your walls with pictures. Thus you will make your homes more attractive to your sons than the tavern, the village, or doubtful associations. Educate all your children, male and female, as thoroughly as your opportunities will allow, and retain the most promising at home to cheer, to dignify, and to ennoble your own calling.

These are your private and your social duties, but remember that you have wider responsibilities; you have duties to the past, duties to the present, duties to the future. Transmit the share of earth which you have inherited, improved and embellished by your labor and taste. Remember that the character impressed upon this generation molds the future communities who succeed you. The surges of migration westward are pouring on without abatement—

> "Multitudes, like which the populous North
> Poured never from her frozen loins, to pass
> Rhene or the Danau, when her barbarous sons
> Came like a deluge on the South."

Every improvement calculated to abridge labor, increases means of subsistence, and multiplies population. The Atlantic telegraph itself "annihilates time and space," brings men into close communion, and invites fresh hordes to our shores from the other hemisphere. That population mingles with our own, and for the character of the blended race and their institutions, even to the Pacific shores, this generation and this community are in part

responsible. Assist to encircle the continent, therefore, not with railroads only, not with telegraphs only, but with all the institutions and sentiments of a glorious civilization, electric with the vital current of human freedom. And remember that the proud spectacle of *an educated people*, dominant over the continent, will never be realized, unless some additional means are devised to educate the whole youth of the rural population.

When the speaker concluded, Mr. Geddes, of Onondaga, arose and said:

Mr. President—I rise to move a vote of thanks to the speaker; but before you put the question, allow me, as one of the farmers of this county of Onondaga, in behalf of my brethren, to return our thanks to your Society for this your third exhibition among us. We thank you for giving us the lessons that must be drawn from placing side by side, for comparison, the finest specimens of all the varieties of domestic animals and of the products of the garden and field, as well as for this magnificent display of farm implements which we see before us. This is a State Society, and I know is the instructor of the whole State; but particularly is it the instructors of the localities that are so fortunate as to again and again witness the great annual shows. Allow me to add that your lessons, in Onondaga, have not been entirely lost; the improvement here is manifest in every branch of farming since you held your fair among us. I can assure the orator, to whom we are about to return our thanks, that the standard he has just held up before us, as showing what a farmer's life should be, if not entirely arrived at here, has nevertheless been approximated. If he will do me the pleasure of riding in my company over these majestic hills and beautiful valleys, I will show him many specimens of high and judicious cultivation, and many a pleasant homestead surrounded with fruits and flowers. And within these houses on the center tables, he shall find elegant and useful books, with the newspapers of the day, and on the shelves many of the standard authors, and in not a few instances some of the ancient classics,—and, Sir, he will find that the women that he will meet there, will acquit themselves with credit either in the parlor or the dairy. We are trying here to pursue the policy that the orator has indicated in his address, and feel fully the want of knowledge; and with welcome we greet him, when he comes to us with the information, that in Michigan, the State has a promising institution of learning, especially devoted to the branches of education that are particularly important to us. May the fullest suc-

cess attend his college. We are interested in its success. We want knowledge. Who wants it so much as we? We are all our lives communing with nature in her inner temples—whoever shall light them up with science will be our benefactor. Those mysterious laws that in the chemistry of nature extract, by means of the organism of one plant, poison from the same earth that gives to a different plant the most valuable food—we desire to understand. Now, Sir, allow me to offer my resolution:

Resolved, That the thanks of the New York State Agricultural Society be given to President Williams, of the Michigan State Agricultural College, for his eloquent and instructive Address, and that its valuable lessons may be preserved, a copy be requested for publication in the Transactions of our Society.

The exercises of the Fair were terminated by the announcement and payment of the awards; and the eighteenth Fair, one of the best ever held by the Society, was brought to a close.

NEW YORK STATE AGRICULTURAL SOCIETY.

ANNUAL MEETING.

WEDNESDAY, *Feb.* 9, 1859.

The annual meeting of the Society convened at the Assembly Chamber at 12 o'clock on Wednesday, the 9th of February.

Hon. William T. McCoun, President of the Society, took the Chair.

The report of the Treasurer, Luther H. Tucker, was read by him, and accepted. The following is an abstract:

Luther H. Tucker, Treasurer, in account with the New York State Agricultural Society.

1858.				DR.
Feb. 12.	To cash from B. B. Kirtland, late Treas..			$310 11
	To Mr. Kirtland's note for balance,.....	$891 80		
	.....	310 11		
	Total, ...		$1,201 91	
	To cash for memberships at annual meeting			164 00
	To cash from A. H. Shultz—a part of the Society's investment,.....			1,000 00
Mar. 30.	To cash from State appropriation, 1857,.			700 00
April 3.	To cash from B. B. Kirtland—installment on note,.....			125 45
May 19.	To cash from A. H. Shultz—total balance with interest, ...			1,075 06
Aug. 30.	To note discounted,.....			793 35
Oct. 2.	To cash from Syracuse Local Com., ...			1,200 00
8.	To receipts for entries at Syracuse Fair, ...	$1,556 50		
	To receipts from tickets &c.,.	9,259 31		
		$10,815 81		
	Deduct for exchanges, &c.,...	9 53		
				10,806 28
	To cash for copies Fitch's Reports,.....			15 00

Nov. 10.	To cash State appropriation, 1858,	$700 00
	To cash returned for premium overpaid,	1 00
	To cash for rent of grounds at Syracuse,	400 00
1859.		
Jan. 25.	To cash from Comptroller—being one quarter's salary for Dr. Fitch, Oct. 1, 1858, to Jan. 1,	250 00
29.	To cash from B. B. Kirtland in full for his note and interest,	816 02
		$18,356 27

Cr.

By expenses at winter meeting,	$46 79	
By premiums " "	460 00	
		$506 79
By expenses and premiums paid on account of Buffalo and previous Fairs,		564 99
By salaries of Secretary, Assistant, Treasurer, and traveling expenses,		2,943 71
By salary paid to Dr. Asa Fitch,		750 00
By Library and Museum expenses,		154 42
By printing, advertising and stationery account,		604 65
By postage account,		204 39
By incidental expenses,		230 63
By premiums and premium expenses,		5,809 60
By expenses of Syracuse Fair, viz: Superintend'ts,		717 25
By clerks in business and Treasurer's office, with committees and in buildings,		857 50
By gate-keepers and guards,		344 00
By watchmen and policemen,		175 50
By additional erections,		239 75
By refreshments for judges, guests, &c.,		400 00
By miscellaneous expenses,		403 76
By payment of note discounted Aug. 30,		798 40
Total,		$15,705 34
By cash on deposit in Albany Exchange Bank,		2,650 93
		$18,356 27

We hereby certify that we have examined the account pre-

sented, and the vouchers accompanying the same, and find the same in all respects just and true.

Dated February 8th, 1859.

W. T. McCOUN, *President.*
B. P. JOHNSON, *Secretary.*
C. S. WAINWRIGHT, } *Auditing Com.*
S. CHEEVER, }

B. P. Johnson, Esq., Secretary, read the Report of the Executive Committee.

Hon. A. B. Conger moved the appointment of a committee of three from each Judicial District to nominate officers for the ensuing year, and to recommend a place for holding the next State Fair. Adopted.

Hon. C. T. Peters moved that no member be permitted to speak more than five minutes on any subject, except by permission of the Society. Adopted.

Also a resolution, that the Executive Committee be authorized to prepare, from the Natural History of the State, a short treatise or essay, upon the herbage plants of the State, useful for animal food, with proper and necessary illustrations thereof. Tabled for the present.

Also, a resolution, that the Legislature be requested to pass a law, authorizing the assessors of the several towns, to take, with their annual assessments, the necessary census of the annual agricultural products of the State. Tabled for the present.

The representation from the different Senatorial Districts, retired to agree upon delegates to the nominating committee.

After a brief recess the following gentlemen were nominated:

First District—John C. Mather, E. G. Faile, Elon Comstock.

Second District—John Harrold, A. B. Conger, William Kelly.

Third District—Wm. Newcomb, Luther Tucker, J. S. Gould.

Fourth District—B. C. Butler, Wm. Briggs, Le Roy Mowrey.

Fifth District—B. N. Huntington, Willard Ives, D. P. Wood.

Sixth District—S. A. Law, E. Cornell, B. R. Johnson.

Seventh District—R. B. Van Valkenburgh, W. W. Stacy, H. W. Dwight.

Eighth District—T. C. Peters, E. C. Holt, E. G. Moulton.

The nominating committee then retired, and the Society took a recess until 4 o'clock, P. M.

AFTERNOON SESSION.

The Society re-convened at 4 o'clock, when Hon. William

Kelly, from the nominating committee, reported as officers,

President—A. B. Conger, Rockland.

Vice-Presidents—E. G. Faile, New York; C. S. Wainwright, Dutchess; Herman Wendell, Albany; H. W. Beckwith, Washington; B. N. Huntington, Oneida; S. A. Law, Delaware; James O. Sheldon, Ontario; T. C. Peters, Genesee.

Corresponding Secretary—B. P. Johnson, Albany.

Recording Secretary—Erastus Corning, Jr., Albany.

Treasurer—Luther H. Tucker, Albany.

Executive Committee—Thomas B. Carroll, H. W. Dwight, E. A. Lawrence, C. Boughton, Alrick Hubbell.

The committee reported in favor of Albany as the place for holding the next State Fair.

On motion of the Hon. William Kelly, the recommendation of the committee, that the next fair be held at Albany, was adopted by the Society.

The Society then proceeded to ballot for officers, when the gentlemen above named were unanimously elected.

Hon. T. C. Peters called up his resolution, offered at the morning session, relative to agricultural statistics.

Mr. William Newcomb, of Rensselaer Co., moved to amend the resolution, so that it should read, "that the Legislature be requested to enact a law *directing*, &c."

After debate, the resolution was adopted and referred to the Executive Committee.

Mr. Peters' resolution relative to a treatise on herbage plants, of the State, offered at the morning session, was then called up, and after debate, the whole subject was referred to the Executive Committee.

H. L. Emery, of Albany, offered the following resolutions on the subject of tolls on canals on agricultural machinery:

Resolved, That it is the opinion of this Society, that the interests of the people and the canals will be promoted by the establishment of a uniform and lower rate of tolls on agricultural implements and machinery, as a large proportion of the revenue now arises from tolls upon merchandise of double the value of agricultural implements and machines, which has but one-fourth as much tolls, or one mill instead of four mills.

Resolved, That the Canal Board be presented with a copy of these resolutions, and respectfully requested to consider them, with the view of adopting a uniform toll on all agricultural implements and machines, and that such toll be fixed as low as one

mill, if consistent with the mutual interest of the people and the canals.

Referred to the Executive Committee.

Mr. E. Cornell, of Tompkins, offered the following:

That whereas, This Society should be governed by fixed rules, in deciding upon qualities of animals offered as competitors for its premiums, so that the exhibitors may be aware of the ordeal through which their animals must pass, and breeders, the standard of excellence to which the Society must attain.

Resolved, That the scale of points, and standard of excellence heretofore adopted by this Society, is regarded as just and proper, and that the importance of having the judges of cattle governed by their standard and scale, in the award of premiums, cannot be too strongly urged upon the board of managers, and that the said board be requested to see that the rule is practically obeyed by the committee. Adopted.

Hon. T. C. Peters offered the following, which was adopted:

Resolved, That the Journal of the State Agricultural Society, established by the Executive Committee, be and the same is hereby approved by the Society, and that the cost of publication be charged in the annual expenses. Adopted.

Hon. T. B. Carroll, of Rensselaer county, offered the following:

Resolved, That this Society concurs in the 4th and 5th resolutions of the friends of the canal system of the State, held at Syracuse, December 29, 1858, in favor of requiring, by legislation, a *pro rata* tariff upon way, with through freight, over the New York Central and New York and Erie railroads; and the imposition of canal tolls upon freight over said roads, so long as any tax shall be imposed upon the property of the State, on account of the canals; and that the Executive Committee of the Society be charged with the presentation of the question as connected with the agricultural interests of the State, to the consideration of the Legislature.

After discussion, the whole subject was laid on the table.

The Society then took a recess until 7½ o'clock.

EVENING SESSION.

The Society was called to order by the President. His Excellency, Governor Morgan, being present, was seated with the President. Prof. E. North, of Hamilton College, delivered a very interesting lecture on Trees and Tree culture, with a notice of

the most distinguished Philarborists, among whom the lamented Downing was most appropriately noticed; at the close of the lecture,

On motion of Hon E. A. Lawrence, of the Assembly,

Resolved, That the thanks of the Society be given Prof. North, for his admirable address, and a copy requested for publication in the Transactions.

Dr. Fitch, Entomologist of the Society, delivered a very interesting lecture on Insects, and exhibited the Hessian fly, wheat midge, the chinch bug, &c., depredators upon wheat.

At the close of the lecture, on motion of Hon. J. Stanton Gould, of Columbia,

Resolved, That the thanks of the New York State Agricultural Society be given to Dr. Fitch, the Entomologist of the Society, for his very valuable and practical address, which he has given this evening, and also for the admirably prepared specimens which he has exhibited of some of the dangerous insect depredators which infest our grain fields and fruit trees.

On motion of Mr. Johnson,

Resolved, That in view of the importance of the investigations being made by the Society, under the direction of Dr. Fitch, the Entomologist of the Society, the Honorable the Legislature be most respectfully requested to continue the annual appropriation of one thousand dollars, to enable the Society to prosecute these investigations.

The Secretary, in answer to inquiries as to the exchanges of seeds through the Society, gave a brief account of what was being done, and of the importance of increasing the exchanges with foreign countries.

The Secretary gave a brief account of the World's Fair exhibition, and of the success of Americans at the exhibition, in answer to request from several gentlemen present.

Hon. A. B. Dickinson, of Steuben, made some interesting remarks on an article published on the subject of dairying in England, and also on trees.

At the close of Mr. Dickinson's remarks, the Society took a recess until 3 P. M., on Thursday, at the Agricultural Rooms.

AGRICULTURAL ROOMS, *Thursday, Feb.* 10.

The President called the Society to order, and the awards of the judges were read by the Secretary, and the Society took a recess until 7½ P. M.

THURSDAY EVENING.

The Society met in the lecture room of the agricultural building—the President in the chair. His Excellency, the late Gov. King, was present.

Mr. Johnson read a report by the visiting committee, on the dairy farms of Lewis county.

The President, Hon. William T. McCoun, delivered his valedictory address, and introduced the Hon. A. B. Conger, of Rockland county, the President elect, who addressed the Society.

After the remarks of the President elect, Hon. J. P. Beekman, of Columbia, one of the earliest Presidents of the Society, after some appropriate remarks, moved the following resolution, which was unanimously adopted:

Resolved, That the thanks of the Society be given to President McCoun, for his eminent services, as President of the Society for the past year, and for his very valuable address; and that a copy of the same be requested for publication in the Transactions of the Society.

On motion of Hon. E. A. Lawrence, of Queens,

Resolved, That the thanks of the Society be given to the Secretary, Mr. Johnson, for his long continued and valuable services to the Society.

Mr. Johnson briefly responded, acknowledging with gratitude this renewed testimonial of the confidence of the Society, than which nothing more gratifying could have been tendered him.

The Society adjourned.

B. P. JOHNSON, *Secretary.*

ADDRESS.

EXTRACT FROM ADDRESS OF PROFESSOR NORTH, AT THE ANNUAL MEETING, ALBANY, FEB. 9.

We give a brief outline of Professor North's Address on "American Trees and Tree Planters."

There has always been a party in this country with views and feelings opposed to the destruction of our native forests. At first small and little heeded, this party has gradually increased until it now numbers its thousands. Their fitting title would be that of American Philarborists or Tree-lovers. Their doctrine is that trees have economic and aesthetic uses, which entitle them to be respected in the forest, and largely planted in orchards, avenues, and parks. They claim that trees make generous returns for the room they occupy. The close relation of trees to the public prosperity, is seen in the present difficulty of finding sufficient water for the Erie canal. The enlargement of the canal and its business requires more water than formerly, when, in fact, the supply is alarmingly deficient. There is one reason for this deficiency, in the wasteful cutting down of forests on the hillsides, whence flow numerous small streams, that unite to fill the vast aorta of our inland commerce.

The destruction of trees not only diminishes the absolute quantity of rain, but prevents its accumulation in springs, shaded valleys and swamps. A bare hillside will shed water like a roof. Let the trees remain as nature intended, and the same soil becomes a sponge, absorbing the rain as it falls, and sending it down little by little to the thirsty lowlands.

In the early stages of our country's growth, little attention was paid to the culture of trees. The names of the pioneer philarborists are few, and their chief encouragement seems to have come from across the Atlantic. There is a queer old house still standing on the banks of the Schuylkill, that might be called the cradle of American botany. It was built by John Bartram, who founded the first botanic garden in this country. Bartram was an honest Quaker, little noticed at home, but honored abroad, as a collector

of rare trees and plants. He kept up an active correspondence with eminent savans in England. Dr. Darlington's recent publication of these letters created a pleasant effervescence in the literary circles of Europe and America.

Andre Michaux, and his son; Francis Andre Michaux, were next described. They were Frenchmen, and served the French government. Yet most of their scientific labor was performed in this country. They were heartily attached to American institutions. They sent home about sixty thousand trees and plants, with many boxes of seeds, as the result of their searches in our nation's wilds. The younger Michaux lived to be eighty-five, and spent his last days in planting a group of American trees. His North American Sylva, recently edited by J. Jay Smith, of Philadelphia, has no equal on the subject which it treats. He bequeathed $22,000 to societies in Boston and Philadelphia, for special purposes connected with the propagation of useful trees.

Among the early pomologists, William Coxe, of New Jersey, stands foremost. A large share of his time and ample means was devoted to the introduction of valuable fruits. His work on the Cultivation of Fruit Trees, was prepared without much help from previous authors; is still appealed to as reliable authority. Mr. Coxe sent scions of the Seckel pear to the London Horticultural Society, of which he was soon after elected a member.

The name of Downing is dear to every lover of rural improvement. His treatise on the Theory and Practice of Landscape Gardening, published in 1841, gave him a solid and brilliant reputation on either side of the Atlantic. The book was thoroughly practical, yet all alive with poetry and sparkling sentiment. It was read like a romance, and removed scales from eyes previously blind to the beautiful in trees and landscapes. The youngest son of a gardener on the Hudson, Downing, was so reserved in his habits, that few suspected the rare qualities of his mind, before his appearance as an author. He had grown up as a neglected seedling might have done in an out-of-the-way corner of his father's grounds, until its rich ripe fruit caught the gaze of passers-by, and pregnated the air with daintest aroma. Downing was thought, by some, to be unsocial and haughty; yet there never lived a man more intensely American. It was a favorite idea with him that America was entitled to a style of architecture distinctly its own, and suited to our climate, scenery and habits. The working out of this idea is clearly seen in his essays and drawings. He was partial to American trees, and often exposed

the folly of prefering such exotic impositions as the ailanthus and the abele to the maple, the elm and liriodendron. His whole life, genius and ambition were devoted to the elevation of his countrymen, to the improvement of their homes, and the multiplying of their ennobling pleasures. His premature death, in 1852, so painfully remembered with the burning of the *Henry Clay*, was an irreparable loss to American literature and art.

Living philarborists are doing much at this time to promote the knowledge and culture of desirable trees. Never was there a period when so much of capital, enterprise and research was given to this most important branch of national industry. The peculiar and promising feature of the present enthusiasm in tree culture, is that its friends are forming themselves into groups for particular studies and experiments. In the cultivation of pears, Marshall P. Wilder, of Dorchester, Mass., takes the lead. He has rendered his countrymen an important service by testing, under his personal inspection, hundreds of imported varieties, a large proportion of which were found to be unsuitable for this country.

Henry W. Sargent, of Fishkill, has honorably won the position of an oracle on evergreens. Ornamental planters are waiting with impatience for the promised work that shall embody the results of his large experience with evergreens imported from foreign nurseries.

Every valuable tree has its enemies. The more useful the tree, the more numerous, busy and implacable its foes. Special gratitude is due to the men of science who have had the patience and skill to capture, classify and find out means for conquering these enemies of good trees. The value of the service which the State Agricultural Society has rendered to the public, in publishing the careful researches of its accomplished entomologist, could not be easily estimated. If the State Society had done nothing beyond the publication of these studies respecting insects injurious to trees, it would have made an ample return for all the money it has ever received.

The speaker next spoke of American poets as having done much to popularize the knowledge and appreciation of our native trees; yet there is still need of precept and example to enlighten the ignorant and quicken the careless. It will be a long time before the lovers of American trees can hope to be discharged from an earnest enforcement of their claims to public and private culture and protection.

ANNUAL ADDRESS

BEFORE THE SOCIETY, FEBRUARY, 1859, BY WILLIAM T. MC COUN, PRESIDENT.

Gentlemen of the Society—Aware that there is due to this occasion something beyond the mere form of leave-taking, with expressions of personal respect and regard for the members of the Society, with whom it has been my happiness to associate, in the management of its affairs, during the year past, yet I fear that what I have to offer, may somewhat tax your courtesy.

We are now at the close of another year's transactions of this Society, and I congratulate you that nothing has occurred to lessen our interest in its prosperity, or to impair the public confidence it has hitherto inspired. Steadily the Society has continued its onward march towards the great objects of its institution, "the improvement of the condition of Agriculture, Horticulture, and the Household Arts."

It has constantly stood by the requirements of its charter, and has ministered to the wants of these paramount interests, by collecting and diffusing knowledge, and by encouragement given to all classes in these various useful pursuits. Excellence in the productions of all departments of the farm, the garden, and the household, has been liberally rewarded.

Improvement in the farm itself, the soil, the best method of cultivation, including the best time and manner of applying manures, and the growing of the largest crops, has met with similar encouragement. So has the inventive genius of the country, when devising new agricultural implements and machinery, or when improving upon the old, to facilitate the labors of the farm. In all these directions, the influence of the Society has been exerted, and with good effect, as our last annual fair, like those which preceded it, abundantly proved. I need only to refer to the report of the Executive Committee, prepared by the Secretary, with his wonted ability and accuracy, for all the information that can be desired on the subject.

The constantly growing necessity for increasing the productiveness of the soil, in order to meet the demands of human wants,

must naturally lead to improvements in the art of husbandry, throughout its various departments. Improvement, however, in this, as in everything else that relates to man's social and moral condition, depends primarily upon the educational means provided for the masses, and the consequent spread of useful knowledge. The sources of knowledge are now open to all alike; to the poor as well as to the affluent. With the acquisition comes power, for "knowledge is power," and it is that quality in man, derived from his physical education, as well as from his mental and moral training, that fits him for his laborious duties as a tiller of the soil, in the great work set before him, "of earning his bread by the sweat of his brow."

This subject of agricultural education, in all its bearings upon civilization and social enjoyments, has lately been presented to our consideration, in the admirable address of Mr. Williams, of Michigan, which is now before us in print. The subject is there discussed with eminent ability. I regard it as a production worthy of all commendation, and one which we cannot too highly appreciate, as a valuable contribution to our stock of agricultural papers.

Next to a thorough knowledge of farming, one great means of success in its operations is, the use of improved implements and labor-saving machines. The last half century has been productive in these respects. Implements, adapted to every kind of work, have been greatly multiplied. Those formerly in common use have been remodeled and much improved, lessening by their use the severity of toil, and rendering the work of the farmer more effective and economical. Among these, enumerate the mowing machine, the horse rake, the reaper, the thrasher and separator, all worked by horse power, and by successive improvements in construction, brought to a great degree of perfection, and we have the heavy work of the farm and the barn, hay making and harvesting, thrashing and winnowing, performed in a much shorter space of time than formerly, and at a greater saving of expense and manual labor.

But while these improvements are in progress, there is another power greater than has ever yet been employed upon the farm, ready, as it would now seem, to take the field, there to do man's bidding in the cultivation of the soil, whenever his inventive faculties shall devise the method of rendering it there, as elsewhere, subservient to his will.

The time for subduing this power, and bringing it into use for

certain purposes, was ushered in with the present century; not, however, to meet the demands of agriculture, for these were not then thought of, but for objects, perhaps, then deemed of more practical utility than any other.

The compressible and expansive properties of steam had become known. It was perceived that its elastic power might be turned to account. The minds of ingenious men were gradually drawn to the subject. The engine was constructed rudely at first; experiment after experiment was made; improvement followed upon improvement, until at length the steam engine stood forth the giant of the earth, perfect in its proportions and adaptations; and whether as a stationary or a motive power, whether for propeling ships or long lines of land carriages, is now justly regarded as the greatest achievement of human skill—of mind over matter, that the world has ever beheld.

It is true, that some twenty-five years before the commencement of the present century, the steam engine was brought into use as a stationary power, in the working of mines and the driving of ponderous machinery.

James Watt, of Glasgow, though not the originator, was the first to devise improvements that produced useful and satisfactory results. By the united genius of Watt, and of Boulton, of Birmingham, their engine was applied successfully to an apparatus, also of their construction, for striking off the sterling coin of England. Such was the perfection of this combined machinery, that four boys, only ten or twelve years old, were capable of working it, and striking off thirty thousand guineas in an hour; the machine itself keeping an unerring account of the number. As yet, no attempt was made to apply steam to the purposes of *locomotion;* but Doctor Darwin (a poet and philosopher of considerable celebrity in his day), after describing the operations of Watt and Boulton's engines, thus *prophecies* with regard to the future of steam power:

"Soon shall thy arm, unconquered steam, afar
Drag the slow barge and drive the rapid car,
Or on wide waving wings, expanded, bear
The flying chariot through the fields of air.
Fair crews triumphant, leaning from above,
Shall wave their fluttering 'kerchiefs as they move,
Or warrior bands alarm the gaping crowd,
And armies shrink beneath the shadowy cloud."

This was published as early as in 1782.

The steamboat and the railroad have more than verified the prediction of the "barge" and the "car," and although we have

not seen "the flying chariot," with its "fair crews," or "warrior bands," there are those of soaring minds at this day, sufficiently credulous to believe, that this phenomenon may likewise happen. That immutable law, however, by which "the apple from the tree falleth to the ground," is directly opposed to the fulfillment of such an expectation. We must be content with the more humble and less venturesome employment of steam. With the portable, and the fixed or stationary engine, steam has of late years become familiarized to the indoor work of the farm, to some extent, I believe, in this country, but to a far greater extent in Great Britain. The economy of it in large establishments appears to be admitted.

Under these circumstances the question is often asked, why may not steam be employed in the outdoor work as well? Such, for instance, as in the draining of land and the breaking up of the soil, preparatory to planting and sowing. This is the great problem with respect to steam machinery—its adaptation to the culture of the soil, which remains to be solved, and which is now in the course of actual experiment. Under the encouragement held out by the Agricultural Societies, in the offer of premiums (and in some instance to large amount,) engines differing in form and in the manner of working, have been constructed and exhibited for trial within the past year; one such is mentioned in the report of our Executive Committee. Another was produced by a citizen of Pennsylvania, and taken to Illinois, for trial upon the prairie land of that State, and has, in a measure, proved successful. It is represented as an engine adapted to locomotion, drawing a gang of plows or plow shares, cutting regular furrows, and turning with ease and precision. (Whether the premium of the Agricultural Society of Illinois has been awarded to this engine or not, I have not ascertained.) These two, I believe, are the only instances of experiments yet made in this country with steam power, adapted to the work of cultivating the soil. The newspapers, however, inform us that a number of steam plows, as they are called, are now in the process of construction in the State of Illinois, for the purpose of further experiments in plowing, and in draining, and in forming the ditch and hedge, to enclose their lands. Another season will probably show the results of experiments in that direction with steam.

In England, during the last twenty or twenty-five years, attempts have been often made to cultivate the soil, by steam power, in different ways, all passing under the general designation of "steam

plowing;" but it never has been reduced to a perfectly successful operation, even in that country of systematic labor, where public-spirited efforts, directed by their most enlightened men (and where, too, the increasing scarcity of laboring hands creates a demand for agricultural machinery) are constantly being made to introduce improvements into their husbandry. A trial of a considerable number of engines, constructed upon different principles, and intended to operate in different ways, took place at the Chester meeting of the Royal Agriculture Society in the last summer.

The Society's prize of £500 was awarded to a portable engine, though fixed or stationery while at work, having six plows, and working three at a time alternately, by means of anchors and pulleys, a man walking by the side of the plows to keep them steady. This engine was found to do the best work of any on trial, but it is said the work was not as good as that of ordinary plows in common use, nor such as good farmers required from their plowmen.

The next best was a traction engine, moving forward on a revolving endless railway of its own, carrying six plows and turning as many furrows at a time. An eye witness of the performance of this engine, says of it, that it appeared to be capable of performing its duty. It walked across the field (which was level, and free from obstructions of any kind,) with as much regularity as a team; carried out its plows, and turned with so much precision, as to leave but few balks, and showed that it was not so much the fault of the engine as it was the fault of the plows, that the work was not more perfectly done.

Even with the imperfect success which attended the trials of these engines, and the qualified praise they received, they were nevertheless regarded as having demonstrated the practicability of using steam advantageously in the cultivation of the soil, and with economy likewise, when compared with animal power.

Indeed, the year 1858 is claimed as the commencement of a new era in British farming, since, by means of such engines and machinery as Fowler's (the one to which the prize was awarded,) they can hereafter, almost regardless of the weather, accomplish the autumn plowing of their heavy soils, heretofore often very much delayed by rains, and sometimes either impossible, or very difficult of accomplishment with horse labor, and the ordinary implements of the farm.

I have stated these facts in relation to the introduction of steam

culture, mainly for the purpose of drawing your attention to one point in connection with it, which seems to me deserving of general consideration, and especially of the consideration of those among us, whose genius or mechanical skill may incline them to look into the subject. Hitherto, as you may have observed, the principal effort has been both here and in England, to get up steam machinery for the culture of the soil, through the medium of the plow. The idea most prevalent is, that the plow in some form of combination, is still to be retained and used with the engine, and that there is no need of any other contrivance to which the power is to be applied or attached. Just so it was with Ramsey's experiment on the Potomac, and with Fitch's on the Delaware, when they undertook to apply steam to the propelling of boats. They thought only of the *oar* as the implement to which the new power could be so easily and successfully applied. So, likewise, when machinery was brought into use in the thrashing of grain, the *flail* was retained as the implement fixed to the arms of a revolving shaft or a reel, and made to strike in rapid succession on the thrashing floor.

A short time, however, sufficed to show that the *oar* and the *flail*, efficient as they were in the hand accustomed to use them, were but ill suited to inanimate machinery, and were soon displaced to make room for the paddle wheel and the toothed cylinder. In like manner the plow, as general as is its employment in all civilized countries, as much as it has been extolled for its usefulness in all ages of the world; reverenced for its antiquity, and "crowned with wreaths," as the symbol of the art that "calls forth the harvests," is nevertheless destined to be laid aside, with other primitive inventions, as a thing out of place, when attached to the farm engine. There will still be ample employment for the plow in its proper place, that is, in its connection with animal power, and the horizontal draft of the ox and the horse. In that connection we can never entirely dispense with it. There is much land deserving of high cultivation, where the steam engine cannot be made available, and which can only be broken up by manual labor and by the plow and the team. The spade in the hands of the laboring man accustomed to its use, is a more efficient instrument in respect to the quality of the work, than the plow and its congeners are capable of doing, but where considerable areas of land are to be improved, spade husbandry is out of the question. It is too slow and expensive an operation for the farm. Necessity compelled the resort to animal

power, for the purpose of general tillage, and the plow was devised as the implement best suited to the capacity of that species of power. With the animal for draft, the plow came into general use; but we all know that the work which the plow performs is always imperfect and incomplete; that its operation is only the beginning—the incipient step in the process of good cultivation, and that it requires to be followed by various other implements to complete the work it has begun. The plow, moreover, is objectionable in another respect—an objection which lies deeper and is very liable to be overlooked, indeed, too much so by the generality of farmers. I allude to the unavoidable pressure which it exerts upon the subsoil. The wedge like form and action of the share in being driven through the soil, though splitting off and raising a portion of it to be turned over, produces a corresponding downward pressure, and leaves a smooth and glazed surface beneath the sole, and to this add the trampling in the furrow, and we have a compact and solid substratum underlaying the whole plowed surface, almost impenetrable to the roots of plants, and unfavorable to their full development. This can only be remedied by the subsoil plow, loosening the earth below, but involving a double expenditure of both time and labor in the very first operation towards good tillage. For these reasons, it appears to me that the plow share in common use, or other implements acting upon the same principle, should not any longer be thought of in connection with steam power. Let that idea be abandoned, and when steam shall be humbled to the outdoor work of the farm, let its object be a higher and nobler performance than the mere drawing of a plow.

The mechanism of the engine should be such as to possess the means *of itself*, and *within* itself, to accomplish such a work, and when it shall be seen, "a field walking like a thing of life," let not the indignity be put upon it, of harnessing it to the plow. There is something about the motions of the engine, which seems to me to despise the labor of tugging at the plow beam, or the pole or shafts of any mere land carriage, but like another Hercules, it prefers to put its shoulder to the *wheel*, and there to exert its strength. It is frequently remarked of steam, that it is a great "revolutionist." This is true in more than a mechanical sense, but I am now speaking of it only as a mechanical power, capable of being applied to the work of thoroughly breaking up and comminuting the soil. For this purpose a transverse cylindrical shaft has been suggested, affixed to the hind part of the engine,

armed with strong steel pointed claws, to operate upon the soil as the shaft revolves with the forward motion of the engine. The skillful mechanic may take the idea from this suggestion.

In many things nature furnishes the type or model for man to work from, in the exercise of his inventive faculties. She sets before him numerous examples of perfect models, wrought with great skill and beauty, from which he may take instruction. "Learn of the mole to plow," is one of the lessons she gives.

This seemingly insignificant animal; this little earthling, is indeed an instructor and a friend of man, though sometimes hunted and destroyed as an enemy.

Hogg, the Ettrick Shepherd, speaking from the experience and observation of thirty years, pronounces the destruction of moles as having deteriorated sheep pastures, and to have been followed by the pining and the foot rot among sheep stock; and the story is told of a worthy old gentleman, a sagacious observer, who to his dying hour would not suffer a mole upon his grounds to be harmed. He had reclaimed from a waste his whole paternal estate, and laid it in grass fields, and he maintained that the moles were his laborers, yearly top dressing his lands, and adding to the depth of the soil and fertility of the sward; and the writer adds, that every field seemed to bear evidence of the good effects of this species of natural fertilizing.

In another way the mole renders an important service to the farmer. It is known that he is a very voracious feeder; he subsists on worms and the larvæ of insects which he finds under ground, where no other enemy can reach them, and at night he sallies forth and pursues his prey on the surface. It is probable, then, that he destroys a vast number of grubs and other creatures whose ravages would all be felt in their season; but it is not to his instincts, so much as to his physical organization, that I would direct your attention. Who has seen this little fur clad animal working his way along beneath the surface of the earth, as if he were in the act of tunnelling for an "under ground railroad," and has not wondered at the power he displays in his subterranean occupation. You see the small ridge he has raised in his progress, occasionally terminating in a little hillock. Examine it and you will find the particles of soil thoroughly disintegrated, and ready for use, in the formation of a most perfect seed bed. How has this effect been produced. The implement used in the operation is not a spade nor a plow; nature has provided him with a better contrivance, perfectly adapted to his case, and

which man may use for a pattern. It is something in shape between a foot and a hand, armed with strong and robust claws. If perchance the creature is thrown on the surface, observe the effort he instantly makes to bury himself again beneath it, and how tenacious appears to be the hold which he takes of the earth by means of these claws, and with what speed his purpose is accomplished.

In this simple operation, guided by the unerring instinct of the little creature, provided with the proper implements, we have foreshadowed a method of disintegrating the soil by steam power, now placed at man's disposal. Let then the moles claw serve as the type of the implements with which the engine shall be armed, and we shall presently see the work of large farms greatly accelerated, and cultivation much more efficient and productive than by any other means.

In thus advocating the cause of steam culture in the way suggested, I must not be understood as supposing that it will ever be a matter of universal adoption. It may be brought into common use in many parts of our country, but cannot be brought into general use. It is only farming on a large scale that will justify the outlay, or a number of small farmers favorably located with respect to each other, may, perhaps, combine, to own an engine between them, yet the old methods of cultivation must still be pursued on a very large proportion of farms. Nevertheless, on the broad prairie and bottom lands of the west, on all smooth and level surfaces free from obstructions, it will be a gratifying spectacle which is already in our mind's eye, anticipating the event of this great improvement of our age (the farmers' steam engine), taking the place of the dull plodding plow, and performing its daily rounds of toil, honoring the practice of husbandry, man's first and best and noblest calling.

It is claimed, in behalf of the inventive talent of Great Britain, and why may it not be in behalf of that of our own country? that when the steam engine shall be brought to that degree of completeness for field work, which is now expected of it, so that it shall prepare the soil in the best possible manner for the reception of the seed, it will, at the same time, be able to carry along with it the seed drill and the roller, and thus, unlike the hand of the sower in the parable, the seed shall not fall by the way side, nor in stony places, but fall in good ground, to bring forth its fruit accordingly.

I cannot forego the pleasure which this opportunity affords me

of saying a word or two here in commendation of *an author* who has presented a very conclusive argument in favor of steam culture, unconnected with the plow. It is contained in a small volume, called "Talpa, or the chronicles of a Clay Farm," written in a pleasing style, abounding in practical good sense, and with a rich vein of humor underlaying the whole work. We have an American edition of the book from the Buffalo press, with a handsome introduction, and useful and judicious notes, by a member of this Society. In a new "Cyclopedia of Agriculture," recently published in Great Britain, composed entirely of original articles on the theory, the art, and the business of farming, as practiced there at the present day, and in the contributions to which, the talents of more than fifty of the most eminently practical and scientific men of that kingdom have been employed; this same author (Mr. Hoskyns) has contributed an article on "steam culture," in which much of the argument before used is reiterated and enforced. He remarks that the impediments steam power, in the work of cultivation, has had to encounter, have been those of *delay*, rather than of *denial*, and the delay itself has been due rather to error than neglect; the error so long persisted in, of regarding the plow as the *sine qua non* of field cultivation, and the necessary medium through which the steam engine was to be applied to that purpose.

Again, the author says in conclusion, and I cannot do better than quote his words, in bringing my own remarks to a close: "It does not appear, from any past experience, that the accomplishment of the most difficult mechanical or other processes, or the most surprising feats of invention, have any practical effect in removing the distrust we still retain of future triumphs of inventive skill; nor are there wanting minds so singularly constituted, as to find matter of congratulation that the culture of the soil has hitherto presented an insoluble difficulty to that great modern invention, which multiplies so amazingly the power of the *human hand*, and by economizing its labor, cheapens the products which toil wrings from nature; but fortunately, invention outruns distrust, and surmounts, step by step, the barriers of alleged impossibility, and if it sometimes have to submit to the rebuke of counting prematurely on its unaccomplished triumphs, it may find support for perseverance, by turning from the apparent discouragements of the present to the annals which extend backward, from the last page just turned over, to be included in the past."

Gentlemen, allow me to congratulate you on the choice you

have made of a presiding officer for the ensuing year. It is with great pleasure that I now resign my place to him, who will bring to the performance of its duties a talent and an energy that will reflect an honor upon the Society, and great credit upon the State to which it belongs. For myself, let me say that during the short period of time that may still be allotted to me on earth, I shall be happy to co-operate with you in the good work you have now in charge, of promoting the permanency of this Society, and the prosperity of the farming interests throughout our whole country.

REMARKS

OF ABRAHAM B. CONGER, THE NEWLY ELECTED PRESIDENT, ON TAKING THE CHAIR.

Gentlemen, Fellow Members of the
Agricultural Society of the State of New York:

It is my privilege to express at this time a grateful appreciation of the trust which, in accordance with your constitution, you repose anew in your presiding officer.

A trust it is, which, in the minds of all men, justly carries with it a sense of high honor conferred, while to such as are intent upon the issues of its fulfilment, it speaks of a large responsibility.

You, gentlemen, who have so generously called me to this post of duty and honor, will not charge me with any affectation of self-distrust, when I say that I have been emboldened to assume this responsibility, and this trust to accept, moved alone and supported in such decision by those kind expressions and those hearty assurances of especial support which you have been pleased to extend. The earnest co-operation which you so uniformly render, that you may advance the prosperity of our Society, and through it that of the farming interest at large, is the only ground on which I rest any expectation of success in the discharge of the duties that may devolve upon me; and I may add that I consider it as not only the secret of your strength at home, but the measure also of your renown abroad.

I may repeat, with pride, that which I first learned with the same emotion, when, as one of your delegates to the United States Agricultural Society, I was in attendance upon its last session in Washington. When the principal business of the Society was over, as I happened to be conversing on the conditions of its prosperity, and the experience gained in the conduct of such associations throughout the country, a delegate from a sister State, who, from his commanding position in the agricultural world, has enjoyed singular opportunities for the forming of such an opinion, said to me, and with great enthusiasm: "Ah! that is a noble society of yours in the State of New York; it stands the foremost in the Union." Elate with the feeling which this compliment had aroused, I interposed, as with a view of ascertaining the facts or impressions on which he rested such an estimate of our

worth; "But I thought that the Society in your own State made a strong claim to this leadership." "Ah," said he, "you have such a noble band of men; you work so harmoniously together."

We may continue, gentlemen, to be worthy of such encomium, as we manifest an abiding resolution to cast aside all local jealousies, personal prejudice, and casual differences of sentiment, and to stand side by side in the fellowship of this great work, sustained in our purpose not only by the incentives furnished by the past, but by the natural outgoings of our daily life. No class of men feel so constantly the obligation of undaunted labor, are so nerved under a lowering sky, and conduct themselves so buoyantly through anticipations of danger, as those whose hourly task brings them in close communion with nature, and acquaints them with her varied teachings.

As when at some calm twilight hour, the drooping grain begins to rear its bowed head, and the blade which wilted under the fierce ray, is bathed with the gently falling dew, or the stem, which shook in the strong blast, returns erect, and stretches to a higher bent, and soon each tiny pore is oped to catch from earth and air new measures of nourishment and growth—we see that our despondency over a stricken crop was inopportune, that the processes of development and fecundity have been re-established—and that with a firmer hold—and believe that ere long each harvester will come in swaying under his golden load; so when, in the councils which shape the work of each succeeding year, should it happen, however rarely, that they are disturbed with divided thoughts or jarring schemes, smit with the fierce breath of passion, or scathed with the keener phrases of debate, and auguries become rife of intestinal discord and permanent schism, soon that which was but a trial of our strength is at an end; what threatened a breach, cements our union; we stand upon what has been decided, and feel reassured of harmonious action and more exalted achievement.

Gentlemen, may it be our happy lot, as we come hither at the close of another year, and pass in review our labors and our success, to know that we have brought not only increased products from our herds and fields to fill the lap of commerce, but contributions from new paths of nature explored to add to the swelling treasures of science, and with fresh zeal and maturer purposes, to devote our energies to our great enterprise, true to the motto so dear to a New Yorker, the record of our past and the pledge of our future, "Higher, Higher still."

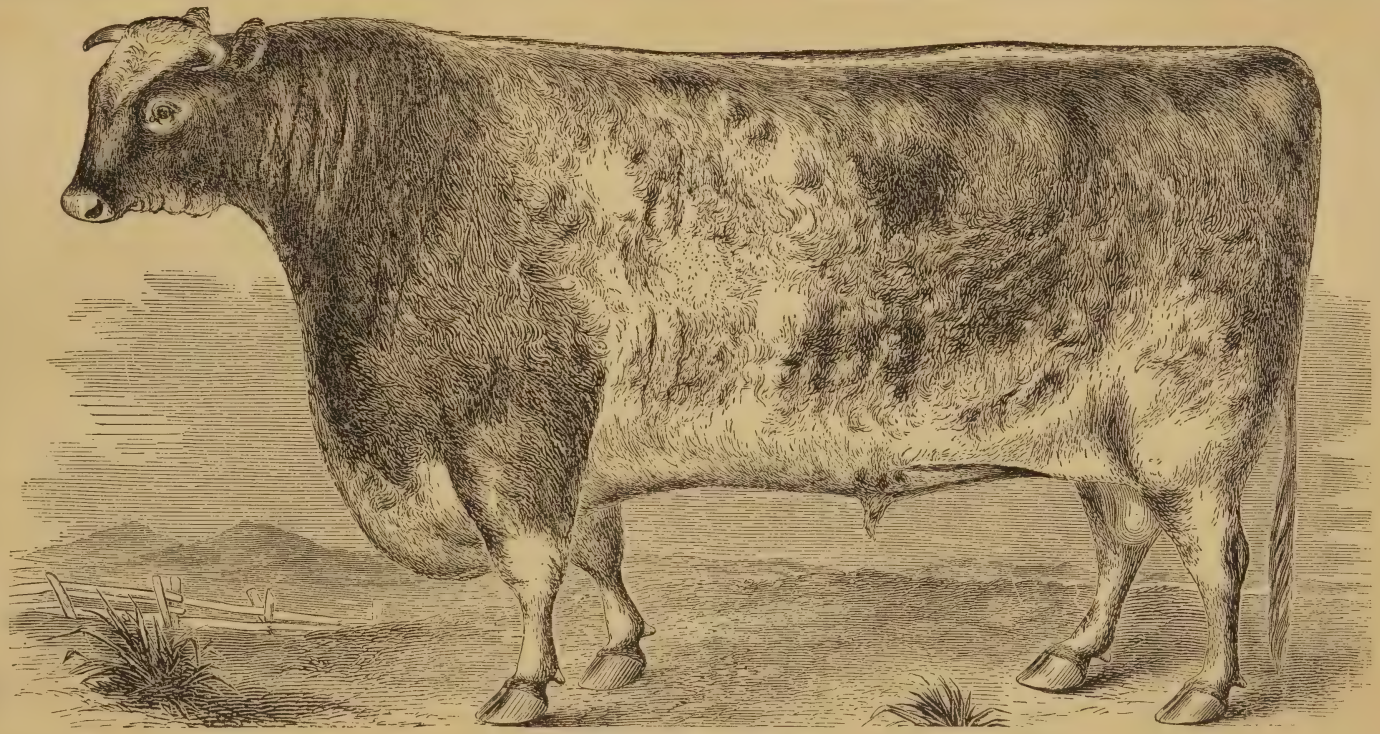
AGRICULTURAL DISCUSSIONS DURING THE STATE FAIR.

These meetings, which have been held for several years at the State Fair, were of unusual interest the present year. The meetings were well attended, and the discussions elicited valuable suggestions from farmers and others in attendance. We deem these meetings of great value to farmers, and it is very desirable to secure as full reports as practicable of the discussions. We endeavored to obtain full reports of the meetings at Syracuse, and were favored with the reports through the papers at Syracuse, and from correspondence to the Tribune and Times, and other journals. We give the substance of the discussions.

On Tuesday evening, Oct. 5th, the meeting was organized at the Voorhees House, the President of the Society, W. T. McCoun, in the chair. T. C. Peters, of Genesee, Harvey Baldwin, of Syracuse, and Solon Robinson, of New York, were the committee appointed by the executive committee to select subjects for discussion, and take the general charge of the meetings.

THE TREATMENT OF CATTLE, OF THE HAY AND ROOT CROPS, DAIRY, VENTILATION, &c., &c.

The Hon. A. B. Conger made an earnest address to the farmers present to abandon the exhaustive process and adopt the root cultivation. He believed in the English dogma, that without roots for food, there must be few cattle; that with few cattle there must be little manure; and that with little manure there must be light crops. Solon Robinson observed, in regard to feeding root crops, that the bad taste imparted to the butter by feeding turnips, could be removed by putting a piece of charcoal into the milk before churning, which would disinfect it thoroughly. Mr. B. S. Carpenter, of Chemung, explained his mode of ventilating stables, and of fastening cattle by stancheons, which method he held to be the best. Ventilation of stables was considered highly important by all. Mr. Geo. Clarke, of Otsego, brought up the subject of using Schooley's Fruit and Milk Preservatory for cooling milk. His experience was somewhat against the practicability of using



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NEPTUNE. (11,847.)

The property of Wm. N. Bullock, Wm. H. Slingerland and Wm. Hurst. Roan; calved Nov. 4th, 1850; bred by John Booth, Killerby, England; got by Water King (11,025); dam Bloom, by Buckingham (3239); g. dam Hawthorn Blossom, by Leonard (4210); gr. g. dam Blossom 3d, by Young Red Rover (4905); gr. gr. g. dam Blossom, by Isaac (1129); gr. gr. gr. g. dam Blossom, by Pilot (496); gr. gr. gr. gr. g. dam Twin Cow, by Albion (14). Neptune was awarded the highest premium by the U. S. Agricultural Society, of $200, for the best bull, and $500 with the best herd of five animals; and was the winner of the first prize at the N. Y. State Agricultural Society's Show at Syracuse, as the best imported Short Horn Bull.

the preservatory for milk, as the frequent entrance for dairy purposes would raise the temperature too high for keeping the ice. The general testimony, however, was highly in favor of its use as a fruit and meat preservatory. All the testimony was conclusive in favor of the profit of dairy farming over the raising of cereals. The great profit of dairy farming was declared to be in the ability by it to restore the products to the soil; while in cereal farming there was little or no compensation. Butter was considered one of of the best products of farms, chiefly when distant from markets where milk could not be readily sold. The process of farming was fully discussed, and the most experienced farmers agreed that butter was better, and could be longer preserved, by churning the milk and cream together. Mr. Robinson observed that the most economical process of husking corn was practiced at the south, where the corn was simply plucked and piled in covered stacks, leaving the husking for the less hurried portion of the year, the fall and winter months. Mr. Crocker, of Broome Co., spoke at some length on the profits of the dairy.

Wednesday evening, Oct. 6, the second meeting was held, Dr. D. W. C. Van Slyke. of Wayne county, in the chair. T. C. Peters, of Genesee, inquired whether farmers found the cultivation of barley less profitable, and whether it was deteriorating and likely to run out, as wheat had in some portions of the State.

Thos. Danforth, of Lafayette, thought the cold and wet season, and the maggot in the lower joint, were among the causes of the failure.

Mr. George Clarke, of Otsego county, said that barley was an exhausting crop; the first and second years were generally good, but after that it fails.

Mr. Danforth said he had raised sixty bushels to the acre, but last year his crop was not over ten bushels. The crop in his town was an entire failure.

The Hon. Geo. Geddes, of Fairmount, said he had had considerable experience in raising barley. It is a sensitive crop. It wants heavy soil, with a cold spring. This year has been the most successful for the farmers of this county he had ever known. The crops are all good. Barley is a very uncertain crop. He did not know that barley was an exhausting crop; had not experimented on the matter.

Dr. Wells, of Seneca county, said that large crops had been raised in his county this year. The northern part of the county is heavy clay soil.

Judge Enos, of Madison county, said that the barley crop in this county had been very poor for the last two or three years. He had raised fifty-six bushels of Hess barley to the acre, but now he got not over ten to fifteen bushels. It seems to have run out —does not even grow where the soil is good. Corn is a good crop to precede barley.

Mr. Hess, after whom the "Hess" barley is named, said his crop was poor this year, and he should give up raising it.

Mr. Brown, of Wayne, thought that barley should not succeed barley. His soil is gravelly loam.

Squire M. Brown, of Elbridge, said he had good success in raising barley until within the last two years. The last year his crop was poor. He always sowed barley after corn. This year his barley weighs forty-six; it has weighed fifty-three. He sows plaster and salt on his corn, and cuts his barley rather green. Salt is good to use in manure. There was no weevil in his barley.

W. A. Mills, of Livingston county, said that barley had always been a crop with him. Three years ago he raised sixty bushels to the acre. Last year his crop was a failure—he only had eighteen bushels to the acre. The summer was, he thought, too hot for barley. He sows two bushels to the acre. His barley was raised on bottom land.

Mr. C. Winegar, of Cayuga, sowed twenty acres last year, and got only fifteen bushels per acre. With him, in ordinary seasons, the crop never fails a good yield if the ground is in good order. His soil is loam. Prefers the four rowed sort. Has raised good crops on corn ground. Seeds wheat land to a small sort of clover, and mows clover two years, then corn, wheat and barley.

Hon. George Geddes.—Our common rotation is two years grass and two years grain.

Mr. Dunning, of Cayuga, prefers two-rowed barley. It yields ten bushels more per acre than four-rowed. Our rotation is to manure sod and turn it under, and plant corn, which averages fifty bushels per acre of the eight to twelve-rowed variety. We depend much on the barley crop. It failed last year on account of the wet season. In former years the crop averaged forty bushels; the last crop only twenty bushels, and we found maggots in the straw, and therefore do not use it for feed. We sow the spring variety of barley.

Geo. Clarke, of Otsego, has always found barley straw good feed.

Mr. Danforth, of Cayuga.—We can't grow good barley upon clay soil.

Hon. Geo. Geddes, Onondaga.—Yet with us, we use light soil for oats, and the most clayey land for barley.

Mr. Bailey, Kent county, Michigan.—I grow barley on new land, and my crops have been eight, fifteen, and thirty bushels per acre. The two-rowed is best, and best soil good corn land.

Col. H. Brewer, of Tompkins Co.—Our corn will average thirty-five bushels per acre on clover soil, which is our best and cheapest manure. There is nothing better than clover land for grain and seeding to any kind of grass. Clover takes well with us with the barley crop. Plaster don't help us any. Pine leaves injure our land, where they decay; and the mark of an old tree top can be traced in the crop. My land is sandy loam, and lime with me is of no use. I never let clover lay but one year. I then plow it under. That is my manure, and cheaper than any other, and the best for corn. My land will average fifty bushels per acre, with twenty loads of manure. I am 1,000 feet above Cayuga lake. Plaster generally is good on sandy land. Ashes are best. I have used salt, but found no difference with two quarts to twenty feet square. I have read and heard much of deep plowing and subsoiling. On my land, it is of no use. I plow only three or four inches deep. In a trial of all depths, two and a half inches did the best. I turned clover seven inches under and did not get as good crops as with a three inch furrow slice. I plow deeper to cover oat stubble. I don't say deep plowing won't do on other folks' land. I only say it won't do on mine, which is very sandy, or loose gravel.

T. C. Peters.—I want the gentleman to upset his own theory by telling what he did when he planted a grape vine, for he grows the Isabella at his elevation, in perfection.

Col. Brewer.—I dug a hole six feet by six, and filled it with brick-bats, stones, bones and compost, and then watered the vine with drainage from the kitchen.

Lewis Marshall, of Orleans Co.—I have sown winter barley in the spring with good results. I sowed, in March, upon land prepared in the fall, and got over fifty bushels per acre. With us, barley sowed in the fall is apt to winter kill. Our soil is what is called a stoney one. Barley sowed Sept. 1, if it does not winter-kill, makes a good crop. Spring-sowed barley ripens in July.

Mr. N. Gowdy, of Lewis Co.—Barley does well with us if we

turn a sod and sow peas and oats, and, after that, barley. It don't do well on sod. We sow in May, or 1st of June.

Dr. Van Slyck, of Wayne county, (the Chairman of the meeting), said: Our barley crops were good until last year, which was very wet. I think barley more exhausting than wheat to the soil. Barley requires a strong soil, in as good order as for corn. He used to turn a clover sod, and plant corn, and follow with wheat and barley. Now we prefer to let the field lay in clover, and plow that under in the fall, then lightly spring plow, and sow barley, and get twenty or thirty bushels per acre. Turn under barley stubble and sow wheat, and get twenty bushels average per acre. Barley has fewer enemies than wheat. Seed clover with the wheat. If we sow barley after corn, we seed clover with it. Winter barley is the most popular, and yields thirty to fifty bushels per acre, and brings 12 cts. a bushel more than spring barley. Clay soil is best with us for barley, and very good wheat land is good for barley. It should be sown Sept. 1, in drills.

Mr. Downing.—We sow wheat after barley and seed with clover, and let that lay two years, and then turn under.

T. C. Peters.—Shallow plowing of such land as I live on, answers the best purpose for corn; say about four inches deep, turning the sod under in the spring, and rolling and dragging it before planting. The land is a slate gravelly loam. We plant 20th of May, four by four feet of the eight-rowed varieties and get fifty bushels per acre.

Hon. Geo. Geddes.—I plowed twenty acres of green shales, deep, and got a good crop. No rule seems to answer for all. I would sow six quarts herds grass with clover.

Col. Brewer, Tompkins county.—I got seventy-five bushels of corn per acre on two acres of my sandy land; plowed four inches deep. It was King Philip and eight-rowed sorts.

Mr. E. Cornell, of Tompkins.—I spread thirty loads of manure per acre upon sod and plowed as deep as I could. I planted Dutton corn three feet three inches apart and thinned to four stalks per hill and made eighty bushels per acre. I made 1,600 bushels in four years upon four acres. My best crop was 123 bushels per acre, weighed, in November, at fifty-six pounds per bushel of shelled corn.

Hon. Geo. Geddes.—Corn will shrink, from fall to spring, fifteen or twenty per cent.

Mr. B. S. Carpenter, of Chemung.—My soil is not all of one

sort. It is very various in its character, and I find it best to plow deep on some fields and shallow on others. I find corn thickly planted on loamy soil six inches deep produces best, though I have, some years, had the best crops upon land plowed only three inches deep. My corn crop is usually about sixty bushels per acre—the best of it 140 bushels of ears—one trial gave 170 bushels of ears per acre when first picked, and 160 bushels dry. This was upon alluvial soil, and the variety, white dent.

Mr. Thomas, of Cayuga.—We plant corn three and a half by three and a half feet usually. A piece planted three feet by twenty inches, yielded one-third more than the usual distance.

Mr. P. Mattoon, of Oneida.—A piece of stiff clay and cobble-stone ridge land, near Oneida lake, plowed with four horses, ten or twelve inches deep, with no manure, gave 500 bushels of sound ears upon five acres; and next year we had a heavy crop of wheat and clover, all owing to the deep plowing. I get rid of the wire-worm by using the Michigan plow, turning the sod down deep and covering it with the second share, say ten inches deep, plowed in spring. I have got good crops upon clay land that would produce nothing before, by this deep plowing. I prefer to surface dress and plow under manure, and also use a little in the hill for corn. My manure comes from the cow stables. I have by this method obtained from stiff clay land, 100 bushels of ears of corn per acre for four years. I believe 134 bushels of shelled corn per acre is the largest crop ever made in this State. I prefer to mix my seed, different kinds of corn together—such as Dutton, yellow flint and red streak.

Hon. Geo. Geddes.—The fashion of measuring corn in the field is not a good standard, Of course, corn will produce more if planted thick.

Mr. Kiersted, of Ulster Co.—I soak seed corn in a solution of saltpeter, plant in hills three feet by three, and cultivate both ways and hoe twice, and get a good crop, better than when I plowed deeper. No crow will pull corn that is soaked in saltpeter. I spread manure broadcast, and have used lime, and made 107 bushels per acre, and seventy bushels without lime. I spread fifteen loads of coarse manure, and plowed it in so as to hide the grass, and then added seven loads of fine manure, and made eighty-seven bushels of corn per acre. On some of my corn land I plow twenty loads of coarse manure, and spread seven loads on the surface. I mix with other manure, hen dung, ashes, plaster,

&c., for the top dressing. I think to put the long manure at the bottom always best. I have made 200 bushels of ears of corn per acre. Also 100 bushels of oats, and three to four tons of hay per acre. I lime all my land, and I mow my grass six to ten years without breaking up the sod.

THE LAST MEETING, THURSDAY EVG., *Oct.* 7.

John M. Strong, of Onondaga, Chairman.

This was the largest and most interesting meeting of the series, and was principally confined to the subject of growing Indian corn.

A portion of the remarks of the principal speakers is briefly reported below. It will largely repay perusal. It would have been still more profitable for more farmers to have been present at the meeting.

T. C. Peters.—Is the agricultural product decreasing? It has been so stated, but I think this is a mistake. Our population is becoming more and more dense along railroads, and grain culture is lessening. He spoke of the necessity and value of agricultural statistics, and thought it could be done through the assessors. He thought the product of corn increasing. He thought the crop of corn this year was 50,000,000 of bushels, while we do not grow as much wheat as we consume. Corn is undoubtedly our great staple.

George Clarke, Otsego.—I advance as an idea that Indian corn is, as a basis of feeding animals, of more importance than any or all roots. Certain results can be produced cheaper with corn than any other crop.

T. C. Peters.—I sowed a plot of ground in drills with Ohio corn for fodder, and obtained at the rate of nine pounds of green fodder per square foot of ground, and as there is over 43,000 feet in an acre we should have about 40,000 lbs. on an acre. In drying, stalks shrink two-thirds.

Solon Robinson said that the best way to cure sowed corn stalks was to set them against a rail or pole on crotches. It should be stacked for winter around these or farm poles held fastened together by rounds like a ladder.

George Clarke spoke briefly of Stowell's evergreen sweet corn for fodder.

T. W. Field.—I have raised both sorghum and Stowell's corn, and found the corn far superior. It is both best for green and dry feed, if it can be cured. Cattle eat all the stalks. It is dif-

ficult to cure the ears for seed. In 1847, three men in Queens county offered their corn crops for premium. The yield was 134 bushels on the best acre. It was planted four feet eight inches apart, each way.

Solon Robinson.—The Stowell evergreen corn originated in New Jersey. It is best preserved by cutting up and housing the stalks with the ears on. They will keep till freezing weather.

John Harold, of Queens county, said Stowell's corn would never do to raise as a crop, on account of the difficulty of curing the corn. It is very valuable as a forage crop. Corn crops are apt to be over-estimated and over-measured.

Mr. Titus, of Queens.—We plant corn four feet apart, four to five stalks in the hill.

Mr. Tucker, of Broome.—I suggest that Stowell's corn can be started in a hot bed. I start corn in that way, and get it three weeks earlier. It does not set it back by transplanting.

Mr. Squire M. Brown, of Onondaga.—I grow corn cheaper than I did fifteen years ago. I plow in the fall eight to ten inches deep, in gravelly loam. I mellow it in the spring with a cultivator, and do most of the cultivation with the same implement. I grew near 100 bushels per acre this year, and it wont cost me over ten and a half cents per bushel. I think farmers would do well to depend more upon corn. I manure by top-dressing with compost, using salt, plaster, and unleached ashes, with barn-yard manure. Muck is good, but I have none. I plant corn on green sward not over four years old. I consider the fodder equal to two and a half tons of hay per acre.

Hiram Miller, of New York.—Much has been said about root crops, but I believe we can produce results with Indian corn much cheaper. Cattle endure cold better when fed on corn than when fed upon roots.

John Harold.—I have tried ashes on alternate rows, and found the best results from ashes. After corn is up on Long Island, fish is used, putting one fish on the surface near the corn, and partially cover it. The Dutch rule of measuring corn is to count a bushel of shelled corn per acre for each ear that the field averages per hill.

John S. Peckham, of Utica.—Is corn profitable to grow by dairymen?

This was answered "Yes," all around.

Mr. Brown, of Madison.—I fed a mare troubled with heaves with corn stalks, and it prevented all difficulties from the disease.

If you dry seed corn, it will keep well. About lime killing wire worms, I have come to the conclusion it wont do it. I have used lime, ashes, and plaster in the hill, and all would not kill them. They will live in wet lime. I have tried various modes, and I prefer to top corn.

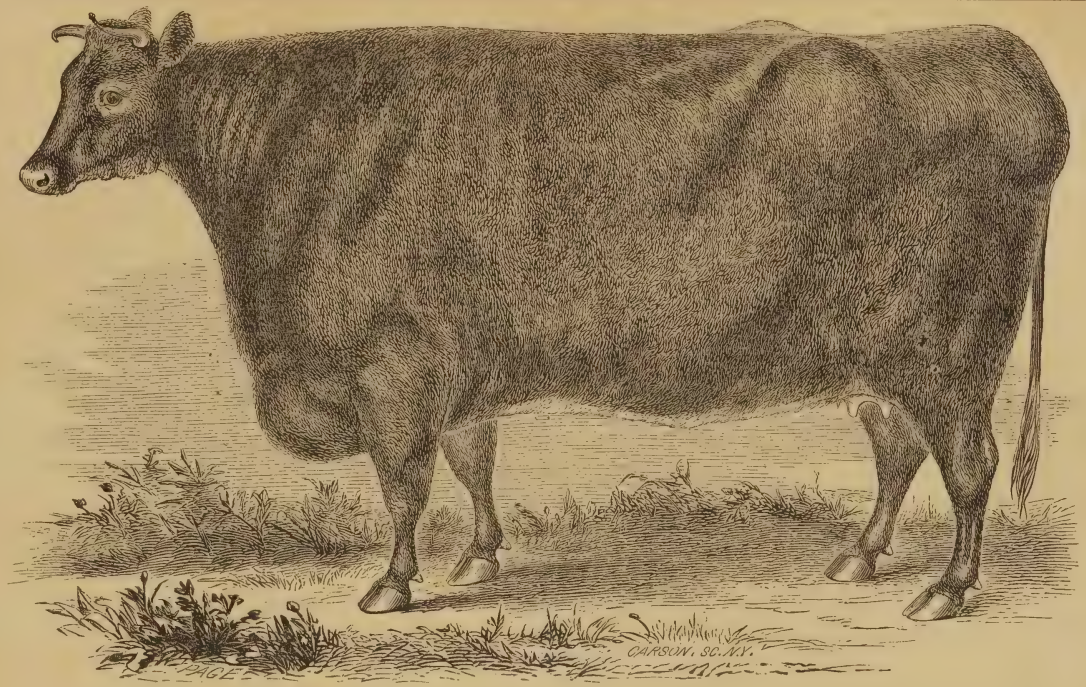
Mr. Olds, of Herkimer—There is but one right way in curing corn. I prefer to pull corn by the roots.

B. S. Carpenter, of Chemung—Stacks can be made over a house which has been described in *The Rural New Yorker*, better than any other way. A sample of butter, made from sugar-cane feed, was pronounced very superior. Cows will eat the cane when full fed with grass. I prefer to cultivate my corn planted in drills for fodder, dropping very close, taking three and a half bushels of seed. I cut and fed sorghum the first of September.

Mr. Crocker, of Broome—I soak seed corn in water, and find that no insect will touch the seed; one pound to the bushel, dissolved in water enough to cover the corn, soaked in warm water twenty-four hours.

Prof. Wilson, of Iowa—If we cannot grow corn with you, we can beat you in growing grass. We can make, as an average crop, from four to five tons per acre of good hay, from the Hungarian grass, and eight tons per acre has been made. It is as easily cured as timothy. It is sown in the spring, say May, and cut in August. It is preferred to timothy, and it is the most reliable grass for the prairie for hay, and the after growth makes good pasture. We sow one-third of a bushel per acre. It has been mostly grown upon new lands.

Thus closed these interesting discussions; and as a general wish was expressed during the Fair, and since, for the continuance of these meetings, the Executive Committee will make every effort in their power to provide for them hereafter, and endeavor to secure a good agricultural reporter, so as to give a full report of the discussions. We are under great obligations to the reporters who have given us the above.



FINELLA.

The property of Wm. N. Bullock, Wm. H. Slingerland and Wm. Hurst. Imported by R. A. Alexander, Esq., Kentucky; bred by S. E. Bolden, Esq., Lancaster, England; red; calved June 30th, 1852; got by Grand Duke (10,284), [who was afterwards imported and owned by Mr. Samuel Thorne]; dam Fay, by Foig-a-Ballagh (8082); g. dam Fame, by Raspberry (4875); gr. g. dam Farewell, by Young Matchem (4422); gr. gr. g dam Flora, by Isaac (1129); gr. gr. gr. g. dam, by Young Pilot (497); gr. gr. gr. gr. g. dam, by Pilot (496); gr. gr. gr. gr. gr. g. dam, by Julius Cæsar (1143). Finella was the winner of the first prize at the New York Agricultural Society's Show at Syracuse, as the best imported Short Horn Cow.

REPORT OF COMMITTEE ON DAIRY FARMS.

ENTERED FOR PREMIUMS, 1858.

ANNUAL MEETING, *February* 10th, 1859.

The committee appointed to examine the dairy farms in Lewis county most respectfully report: That in the performance of their duties they passed through several towns in the county of Lewis in September, the farms being located in the towns of Turin, Martinsburgh, Lowville and Denmark, and examined seven farms; six of them were cheese dairy and one a butter dairy farm. In passing through these several towns, it was most apparent that a spirit of improvement was abroad of the most gratifying character. Farmers are giving evidence of the improvements in the neatness apparent in the farm itself, in the new and substantial dwellings and commodious farm buildings which are to be found on very many of the farms completed, and on many others in progress. And at most of the farms which we visited we found that still further improvements were in contemplation, not satisfied with what had been already accomplished. The surroundings, also, of the dwellings, were in many cases of the most attractive character, and fruits, flowers, and the choicest of vegetables, gave evidence of the refined taste of the household. It is true there are many farms that have not yet been brought under the influence of these improvements; but in the towns through which we traveled, they are rather the exception than the rule.

It was most gratifying to find such a state of things in this county which a few years since was considered as almost unsuited to first rate farming. That day has however passed, and Lewis county can now with pride point to her many farms that can compare creditably with the farms of the most favored counties of our State.

We were pleased to find that attention was being given to draining and irrigation in many cases; and thorough manuring was attracting notice as it deserves, the farmers realizing that unless the land was fed the crops must suffer; permanent pastures and meadows also are to be seen, and no serious difficulty exists in securing them.

The very commodious farm barns that are erected and in process of erection in this county, is a very marked feature. Some of these barns are particularly described in the reports on the separate farms, together with preparations for the distribution of liquid manure in one case, and we were assured that the enterprising farmers of the county, seeing the advantages derived from these capacious and convenient establishments, would soon have erections equally convenient where they did not at present exist.

The improvement of the dairies in this county is a marked feature in its history, and abundantly shows what enterprise and skill can accomplish in a region so famed as this is for its pure water, its nutritive grasses, securing butter and cheese from its dairies that command a price equal to any in our great seaport town. It is almost enough, in market, to say that the butter is from Lewis county dairies to secure its prompt sale; and it is believed that a spirit is abroad that will soon secure this uniform superiority for all the dairy products of the county.

We were gratified to find in almost every dwelling which we entered, the valuable agricultural papers of our State, as well as the Transactions of our Society, showing that the farmers are reading and thinking men, as the appearance of their farms would indicate.

In deciding upon the premiums to be recommended to the Executive Committee, we have kept in view, as important and necessary, evidences of good farming and good darying—

That the soil of the farm should be good, well tilled, and kept clear and free from weeds; and that it should be divided advantageously into fields, well and substantially fenced. The barns, stables, and other out buildings to be substantial and well adapted to the purposes of the farm, both in regard to the housing of the products, and the care and comfort of the stock. The stables so arranged as to prevent the loss of the liquid manures, and convenient yards for cattle, well sheltered, and water of easy access at all times; other out buildings neat and appropriate, and properly located; dwelling, neat and comfortable in its arrangements and surroundings, showing that taste and comfort are combined. The orchard and the garden, where all that is necessary for the family, is suitably provided for.

Dairy requirements.—First and all important, is the dairy house, which should be convenient, well ventilated, and neat and tidy in all its arrangements, with necessary utensils for preserving the milk, and separate departments for cheese made, and where but-

ter is manufactured, a preservatory or other suitable arrangement for preserving the milk, cream and butter.

The stock upon the farm to be of good character, and adapted to the business to be performed; their condition to be such as would best advance the interests of the owner, and suitable accommodations for the dairy stock. The manufacture of the dairy products to be of a character that will command in market, when in competition with others, the best prices; and the relation of the owner to the improvements which have been made upon the farm.

In our examinations, it is proper to say that we did not find, in each particular case, all these requirements, but we did find, in most of the farms and dairies submitted to us, in a very high degree, the necessary approximation, to entitle the competitors to the awards, which we have deemed ourselves justified in recommending to the Executive Committee.

Where so much excellence existed, and of such uniform character, as in the several cheese daries examined, it was a matter of no little difficulty to discriminate. But we have, in making up our awards, taken into consideration, not only the dairy itself as completed in the preparation of the cheese for market, but the whole establishment, in all its details, in no case recommending an award, where the quality of the cheese was not of a high and uniform character. We have also kept in view, the relation which the owner bears to the present condition of his farm, believing that the objects of the Society will best be promoted by encouraging those who, by skill, careful and judicious management, have secured the improvements upon their farms.

The method of manufacture of cheese and butter is given by the competitors, and we do not consider it necessary to give our views in relation to the general methods which are deemed most desirable, as they are to be found in our Transactions, and in the main, have been adopted by those who have presented their farms and dairies in competition.

It is proper for us to state, that the section of the county which we visited, comprises but a portion of this excellent dairy county, and that as we were advised, another portion of the county which did not come under our notice, was even superior in its character, and more uniform in the excellence of the farms and dairies, than that portion which we examined.

We regretted that the time at our disposal, did not permit us to visit this section of the county. Had the excellent dairymen

entered for competition, our arrangements would have been such, as to have given them due attention, and another year, perhaps some of these may be found among those entered for the premiums of the Society.

The farms which we visited and from which reports have been received, we shall briefly notice, referring to the reports of the farms to which premiums are awarded by the executive committee, for more complete account of the farm operations.

James S. Jackson's farm, of Turin, contains 165 acres, forty of which is wood land, three acres in roads and 122 under culture. Mr. Jackson has devoted much time and money in reclaiming his farm and in placing upon it suitable buildings for the uses of the farm. His buildings are most commodious and well designed and arranged. His barn, erected the past season and about completed when the committee examined his farm in September, is eighty by fifty feet; stone basement eight feet high, where he stables sixty three head of cattle, and draws his manure daily from the stables. His stables floored and guttered, so as to carry the urine to the cistern. Above the basement his barn is covered with siding sixteen feet long, battened and painted; floor in center fourteen feet wide; bay, each side, eighteen feet by eighty, twenty-four feet high in front, and fifteen backside. Granary eighteen feet by ten, lined with brick; alley six feet wide, passing from thrashing floor to barn yard. The liquid manure from his stock runs into a cistern holding 700 barrels. He has a liquid manure distributor made by Mr. Frazer, of Trenton, Oneida county, who superintended the building of his cistern, &c., at a cost of the whole $140. This new barn is similar to many of the barns erected in this county, which are as marked features of the county almost as the celebrated farm barns among the Pennsylvania farmers. They are very convenient, and conduce greatly to the comfort of the stock, and in every point of view render the expenses of the farm much less than they otherwise would be. The dairy stock is always put in stalls for milking, and housed during winter and cold weather.

Mr. Jackson has a horse and carriage barn thirty-four by forty-four feet, very convenient and well finished and painted; sheep barn, twenty-six by thirty-six feet, all enclosed; dwelling house, two stories, eighteen by forty; wing and wood house, one and one-half story, thirty by forty; cheese house thirty-eight by forty; work shop and hog house, thirty-six by thirty-six, shop part twenty-four feet square; brick smoke and ash house. Front door

yard enclosed with cast iron fence on cut stone foundation, very tastefully arranged with shrubbery and flowers; garden well arranged with picket fence, and fences around his cow and horse barns, painted: barn yard paved in front of barn twenty-seven by thirty yards. The cheese room of Mr. J. was in every respect convenient and neat in all its arrangements, and we were fortunate in meeting his daughter attending to her duties when we examined the dairy; and we had occasion, afterwards, in the house, to notice her work, showing that the very best education does not unfit young ladies for the discharge of the ordinary duties of the household but lends attraction to every department. We consider Mr. Jackson's buildings and arrangements superior to any we examined and worthy of examination by farmers intending to build. The improvements made by Mr. Jackson on his farm consists in removing large quantities of stone, many large bolders, and placing them in walls. One meadow of twenty acres, entirely freed from stone, and Ketchum's mower used for cutting the grass without hindrance. Draining has been practiced and with manifest advantage; prefers to cut his grass as soon as out of the blow. Mr. J's farm is under good fence, his fields are clean, his crops were good, and everything around him showing the skillful and enterprising farmer. A vast amount of work has been done by him in reclaiming and bringing his farm to its present condition, and hereafter it cannot be doubted but that his income will be satisfactory. Mr. J. has improved his fruit orchard, and has a very excellent collection of our best apples.

Mr. J.'s dairy consists of thirty-two cows and heifers, equal to twenty-six old cows as they commonly estimate them; Mr. J. considers them equal to twenty-four. They are what are called native and Durham or Ayrshire cross, which are approved for dairy stock. A portion of the heifer calves are reared so as to keep up a supply for the dairy stock of the farm. Butter made, 1,112 pounds, and 10,331 pounds cheese; butter made early in spring and late in fall.

Mr. J. sold his cheese, deliverable about every fortnight, and the average net returns was seven and a half cents per pound, butter at twenty-two cents net per pound. The quality of the cheese on hand was good, and showed much care and skill in the manufacture.

Mr. J. does not keep full farm accounts; he keeps debtor and

credit with all his laborers; weighs and measures his products sent to market; he is satisfied that a full account should be kept, for the benefit of the farm and the farmer. In the estimates which the committee have made, the returns per cow from this dairy is $39.40 each.

In Mr. J.'s statement he has entered at large his expenditures for permanent improvements in buildings, &c., which are not required in the statements called for by the executive committee, and to which he has referred in his statement of his accounts.

NORMAN GOWDY'S FARM—MARTINSBURGH,

Contains 250 acres of very fair land, though requiring from the nature of the soil, a special course of treatment. This farm he has had under culture for three years only; 237 acres are under improvements. The soil is principally a gravelly loam, but has some lime rock, and requires to be broken up once in six years, and cultivated with grain crops, and manured, or it fails to give good hay. Mr. G. has drained muck land with clay subsoil with good effect; his manure is taken from the barn yard in the fall and spread on his newly seeded meadow land.

His buildings: Dwelling, thirty feet square; wood-house attached, twenty-five by thirty feet; cheese-house, twenty-six by forty feet; barn, forty by fifty feet, with shed attached for storing tools, &c., on north end, and on south end, cow barn twenty-eight by sixty feet, sufficient for forty cows; another barn adjoining, thirty by fifty-four feet, for hay, and thirty feet stables for young cattle; another barn thirty by forty feet, for hay and corn fodder. Pure hard water in abundance and easy of access. Dairy cows always milked in their stalls. Thirty-two cows,—twenty-five from a cross of Durham bull on native cows, for fifteen years. Cattle are stabled nights and in stormy days; if cold, at all seasons. Mr. Gowdy keeps his stock in good order; two tons of hay and coarse fodder allowed each cow, he believing that the cows are much more profitable. The general management of Mr. Gowdy's farm is good, and his buildings, fences, &c., are in good order, his dairy room neat and attractive, and the character of his cheese excellent.

Mr. Gowdy, although not keeping his farm accounts by entry every day, keeps the facts and results so recorded from time to time as to be deemed reliable.

The water on this farm is mostly hard water.

In the estimates which the committee have made upon the same general basis as Mr. Jackson's, the returns per cow from this dairy is $37.64.

L. S. STANDRING'S FARM—Denmark, Lewis Co.

Contains 300 acres, 270 acres being improved, 155 acres clay loam, with clay subsoil; remainder sandy loam, with gravelly subsoil; about 20 acres underlaid with lime rock. Mr. S—— manages his farm well, and manures liberally, making about 400 loads annually in his yards, and uses plaster freely. He makes four good wagon loads of manure for each animal except pigs. Stable manure applied in a green state on corn and barley ground; the manure from the yards is heaped in the spring and drawn out after the harvest and applied to the summer fallow. Stock, four horses, 46 cows, 17 to 25 head of young cattle; cows mostly native, with a cross of short horn; good warm stables for all the cattle; feeds good hay, with barley meal, to cows in milk, and plenty of water; shelter and full feeding decidedly the cheapest; about two and one-half tons of hay per cow for winter.

Farm buildings are very convenient and attractive. Stone dwelling, two stories, 22 by 40, wing, 30 by 66, with yard and garden attached in admirable order, with flowers, fruit and vegetables; and a tenant house, 18 by 36, wood-house, ice-house, &c.; cheese-house, 25 by 50; carriage barn, 25 by 30; horse barn, 36 by 40; cow barn, 25 by 60, and one, 25 by 46, lower part used for stabling, lofts for hay; two hay and grain barns, 40 by 50; two do, 36 by 40, with leanto attached; corn-house, hen-house, &c.; all the buildings in good order and repair; fences mostly rail, staked and capped.

Farm accounts are not regularly kept, but general results are ascertained. Timothy hay considered best for dairy purposes, cut in the second blow.

Low bog land has been reclaimed by ditches, with great advantage. Taking the farm together, it is well managed, and the crops of grain raised upon it in favorable seasons are very large; has raised 42 bushels winter wheat per acre. The Deer river passes through a portion of the farm, and a sloping stone wall, from the river bed to the top of the bank, has proved a protection against floods, and is a capital arrangement.

Mr. S. devotes to cheese-making, principally, his cows, and we

found the cheese excellent—the arrangements for making very satisfactory. His cows are always milked in the stables; we found this the practice on most of the farms visited. He rears his heifer calves which he thinks promising, and the dairy is replenished from these as they grow up. On this farm it is apparent that the object of the owner is to have everything well done, and at the same time economically.

Mr. S.'s farm has many natural advantages, and is a very attractive one, and he is turning these advantages to good account; and it would have added much to the satisfaction of the committee if Mr. S. had kept regular accounts, so that the transactions of his farm could have been clearly ascertained and understood.

In the estimates which the committee have made, as upon the others, Mr. Standring's returns per cow from his dairy is $34.62.

CLEMENCE WHITAKER'S FARM—Martinsburgh.

Contains 500 acres, 350 acres under cultivation. Soil a uniform loam, based on the lime rock, and is among the best dairy farms in the county. Granite and bolders are mixed with the soil. Deep plowing on this farm, with the method of manuring adopted, 25 to thirty loads green manure to the acre, drawn from the stable to the field and spread; has doubled the product of the farm; 350 loads manure annually made from the littering of the cattle with straw.

Timothy and clover are the grasses used; has about 100 acres of meadow; average, one and a half tons per acre; cuts timothy when it begins to bloom.

Stock.—One yoke of oxen, fifty cows, forty-five young cattle, nine horses; cattle mixed with Durham and Devon; cattle fed in their stalls in winter, with hay and straw in abundance; cows are reared on the farm, and milked in their stalls; water brought in stable and yards; swine killed at one and a half years old, weighing from 300 to 500 lbs.; common breed.

Fruit.—200 apples, chiefly grafted fruit; pears, plums and cherries; manures his orchard often, and prunes his trees judiciously, and his orchard shows the benefit of good treatment.

Buildings.—House brick and stone, two stories, 30 by 60; wood-house, 30 by 30, two stories; dairy-house, 24 by 40; corn-house and granary, 20 by 30; hog-house, 30 by 40; horse-barn, 30 by 40; cattle-barn, 50 by 75, with basement for stabling 80

head of cattle; basement, eight feet, of stone, with door-ways sufficiently wide to drive in team; upon this stone wall stands the frame, with twenty feet posts; floor through the center, fourteen feet wide; bay on each side, eighteen feet wide. Mr. W. has an arrangement by which the loaded wagon is taken up from the floor to the top of the barn and unloaded into the bays, saving the labor and expense of pitching over the beams. This is done by horse power attached to tackle blocks, and is a capital arrangement. This barn has been built about six years, and was, as we understand, the first of these capacious and convenient barns built in the county, and they were found so well adapted to the purposes of a dairy farm, similar ones are being built on many farms.

Mr. Whitaker's farm is fenced with stone and turf wall, 190 rods; 220 rods of half wall and post and board fence; 400 rods board fence, and the balance of the farm rail fence, all in good condition.

Mr. Whitaker was an early settler in this county, and has been very successful, as his farm would indicate, it being well cultivated, discreetly managed, and in good order.

His cheese dairy is one well known for its superior character. He makes a cheese a day during the season of making, weighing from 115 to 120 lbs., and when we were at the farm the dairy-room presented a most attractive appearance, filled with as fine cheese as we had seen. Most of the cheese is made under the personal direction of Mr. Whittaker, now quite an aged man. We were much gratified with this farm and dairy, and Mr. W. deserves great credit for the perfection which has been attained in his dairy.

We regret that Mr. Whitaker has not answered fully the questions prepared by the Executive Committee. He keeps no account, except, as he says, "when he buys property of any kind, pays the cash, and when he sells property, sells for cash; so that at the end of the year, what cash there is in my pocket belongs there as net profit, varying according to season and circumstances."

How much better would it be for even this excellent and successful farmer, if he kept an account with his different fields and crops, and his course of management yearly, so that he might ascertain which of them added to the money in his pocket, and which caused a loss and diminished the amount on hand at the end of the year. Surely Mr. W. must see that he might, with very little trouble, secure such an account as would enable him to adopt that system, which would, upon the whole, be most advan-

tageous and remunerating. Mr. W. does not give us the value of his stock, nor the cost of carrying on his farm. An endeavor was made, after his report was received, to obtain such statement, but Mr. W. stated he could only make it from estimates, which might not be correct; he declined to alter the statement furnished. We recommend the publication of his statement as given. It is a valuable one as regards his manner of farming, and of managing his dairy operations, and when it is seen that

From 50 cows he has made 20,000 lbs. cheese, 400 lbs. to the cow, sold for,	$1,800 00
And 2,200 lbs. pork,	132 00
	$1,932 00

there can be little doubt of his success as a farmer and dairyman.

The completeness of his buildings, the neatness and well ordered arrangements and management of his whole farm, the character and value of his dairy, entitles him to special commendation, and the committee deeply regret that, for the deficiency of the papers presented, they are prevented from adding his farm as one of the dairy farms entitled to the premiums offered by the Executive Committee.

EDWIN PITCHER'S FARM—Martinsburgh,

Contains 420 acres—300 improved. Soil muck loam, mixed with slate; and the farm is well watered from springs upon the farm. Eighty cows are kept, and heifers are raised to keep up the dairy. Has but one pasture in summer for his cows (except about twenty acres for night pasture), which he deems preferable, as the cows are more contented, and do better through the season than when changed in their pasture. From twenty to thirty acres meadow land are broken up every fall, plowed eight inches deep, and sowed in spring to peas and oats. This plowed in fall, and manure drawn out in winter upon it, and sowed to wheat as early in the spring as practicable; seeded down with six quarts herd's grass and one pound of clover seed per acre, which Mr. Pitcher thinks preferable to thick seeding, as the meadows will last much longer. Instead of a roller, he uses a bush to level his land and cover the seed, made with a four by four inch scantling, ten feet long, with nine two-inch holes bored through the head piece, in which are placed small trees, with the tops on, the butt ends through the head piece, and a chain around the center brush, across the head piece; twenty acres can be bushed in a day, leveling all the dead furrows, and leaving the

surface smooth for mowing with a machine. (We saw meadows thus put down, which were in fine condition.) Mr. P. usually raises from twenty to thirty bushels spring wheat per acre, using Scotch and China wheat mixed; thinks he gets a better yield by so doing. (Upon what principle this is secured, we were not advised.)

His straw manure is spread in the fall on his new seeded grass land, and plaster put on in the spring. Usually cuts from two to three tons per acre of good hay. Always seeds down with the second crop.

Cows are kept in warm stables, and in fine order, so as to come out in the spring to pasture strong and healthy. Stables are built so as to throw the manure back of the cows, inside of the stable, and is drawn out at leisure.

Mr. P.'s cheese house is 44 by 24, nine feet between joints, with two 15 light windows on each side and ends, the top sash to be let down in hot weather; also ventilation in the center above, to let off the hot air. The floor is matched, with seven trap doors under the tables, to let up cool air from below, which is deemed very essential to make good cheese. The thermometer should not be above 75 degrees in a cheese room. Cheese, if well made, and not overheated in a cheese house, will be mild and good flavored, and keep good through the summer. The cheese house is surrounded by shade trees, on the south and southwest, and stands up two feet from the ground for the purposes of ventilation. Mr. P. has cheese turners, similar to cheese box covers, with a rim three and a half inches wide, on which the cheese stands during summer. When the cheese are turned, put one on top and turn the cheese over on to a new cover, and that on the next, and so on till all are turned, which preserves both edges of the cheese while turning. (Mr. P.'s cheese are very large, averaging over 200 lbs., some weighing 260 lbs. His method of turning is the best we have seen, and renders the work very easy, and preserves the cheese in good condition.)

Mr. P. gives a statement of the proceeds of his farm, which shows a large return from his grain portion of the farm, and from his dairy.

From eighty cows he has made 35,000 lbs. of cheese; equal to 437 lbs. per cow, besides butter sold for $100.

Mr. Pitcher's cows are of the common breed, well selected and well kept. Mr. P. gives a statement of his stock, and implements, &c., but has not answered in detail, as required, the questions proposed by the Executive Committee. Were there nothing more

to be taken into consideration than what is above given, and the balance in favor of the farm, a favorable report upon the whole farm might have been expected. When visiting this farm, the committee were much gratified with the appearance of the dairy house. The cheese were of a character to do credit to Mr. Pitcher, and the high price which we were assured the cheese commanded in market, affords good evidence as to their quality. Mr. Pitcher's cows were in good condition, and showed good care and attention and good pasturage. But when we examined the approaches to his cheese house and dwelling, the condition of his barns and outbuildings, the general appearance of the farm itself, its fences, and other matters which could not escape our observation, we regretted that where so good cheese was profitably made, so many other things around should so mar the appearance of the whole establishment. On suggesting to the owner these things, his reply, in substance, was, "He farmed to make money, and these buildings answered his purpose." If making money was the sole and legitimate object of a farmer, if the influence he exerted upon his neighborhood was of no account, then, perhaps, money-making alone might answer the purpose of a mind ardently devoted to it. But it appears to us that a far higher and nobler object is the province of the American farmer—the good farmer in every sense of that term. While he should be economical and prudent in all his operations, *so as to make them pay, and pay well, too*, he, at the same time, should have his farm and buildings attractive, convenient, and suited to his work. He should see that in bringing up his household, their minds and tastes were cultivated and refined, by all the surroundings of the farm, so that while the money is secured, the treasures of the household are enriched, and the domestic home made attractive in its every arrangement, the abode of refinement and intelligence. The awards of the Society are not given to the man who makes the most money, as a *matter of course*, but to the man who, under all the circumstances of the case, has done the most to the farm entrusted to him, and has, by his example, contributed the most to the advancement of his pursuit, and at the same time has rendered his labors remunerative. The farms receiving the premiums of the Society, should, in a good degree at least, be in such a condition as when examined (as they will be) to do credit to the society, and on examination lead others to a higher and better standard for the future. Such being our view of the duties devolving upon us, we cannot recommend a premium in this case.

WILLIAM WHITAKER'S DAIRY FARM—Turin,

Was examined by the committee. Mr. W. is a son of Clemence Whitaker, whose farm we have noticed, and resided in the section of the county near his father until within a few years past. He has a farm of 250 acres, 30 cows in his dairy, and makes a cheese a day, and has from 350 to 400 pounds of cheese per cow for the season. His dairy room and arrangements were convenient, very neat in every part; cheese even, good flavored, and well made; uniform in character.

Mr. W. feeds in winter one and one-half to two tons of hay per cow, mixed with coarse fodder. Cows kept well are decidedly the most profitable. Mr. W.'s present farm is on the slate formation, with soft water. His former location was on the limestone formation, withhard water. From his experience he says he prefers the limestone formation as producing the *best feed, best butter and cheese, and the best beef.*

Mr. Whitaker's buildings have been erected a long time, and are not specially adapted to the dairy, and will be replaced by others better adapted to the purposes of a dairy farm.

Mr. Whitaker has not sent in his statement. The above brief description is given as being a part of our examination.

J. C. COLLINS' DAIRY FARM—West Turin,

Contains 150 acres—90 acres improved. Soil sandy loam, slightly mixed with clay. From 45 to 50 acres in meadow, 30 in pasture, residue under culture. The main business of the farm is butter making. He has thirty cows in his dairy, including six heifers, mostly Devon grades, from one-quarter to one-half blooded, originally from the red cattle of New England; one of the old cows still on the farm—a large roomy cow, good milker, and her descendants generally fair milkers. Calves are reared from best dairy cows. Mr. Collins, and his father before him, used the Devon stock, which are deemed very valuable. Mr. Collins applies from twenty-five to thirty loads of manure per acre, mostly stable manure. Cattle are stabled in winter, and the manure is thrown out daily and remains exposed, which practice is not to be commended. Manure is well rotted, and muck incorporated with it before applied. Prefers putting on manure in the fall. Plaster used on meadows and pastures with good effect—brings in white clover in abundance, giving fresh and desirable food for the dairy stock. Usual yield of hay, two and one-half tons per acre; this year

three tons. Uses two tons per cow during winter, in addition to coarse feed, believing that a cow in good condition in the spring is worth much more than the difference in the cost of feed. A portion of the meadow used, about eight acres, has never been plowed; it is irrigated from a small stream of soft water passing through his farm, and the portion irrigated averages from three to four tons per acre. Corn sowed broadcast is used for fodder to great advantage, especially in dry seasons, keeping up the yield of milk equal to grass feed.

Hay is cut when timothy is in full bloom. Weeds and foul stuff are subdued by cutting twice in the season, first in full moon in June, and lastly in full moon in August and September.

Butter is made from April 1st to middle of December—about thirty weeks. Schooley's Preservatory is in use on this farm with very manifest advantage; and several dairymen are about to erect them on their farms. The cream kept in the preservatory before churning, and after the butter is worked, it is placed in the preservatory for twelve hours, and then packed, and the butter, after packing, remains in the preservatory until sold. We consider this a most valuable addition to every butter dairy farm, and its general use will prove of very great advantage to the dairyman. Dutch cheese is made from sour milk. These are small balls, weighing one-quarter of a pound, and sell for $30 per thousand. Twenty-five cows will furnish milk enough for a thousand in a week. Process of making is very simple, and is contained in Mr. C.'s report. Mr. Collins considers this as nearly clear gain.

The farm of Mr. Collins was occupied by his father, sixty years ago; his buildings, though long since erected, are convenient and in good order; his yard, garden, &c., well cared for, all indicating the careful and thrifty farmer; and the improvements made by Mr. C. himself, shows the relation which he sustains in connection with the farm. The quality of the butter made, first rate, averaging for the past eight years, 150 pounds per cow, and bringing from twenty-three to twenty-five cents per pound. Mr. Collins' farm was found in good order, his fences generally good, his lands clean, his cattle thrifty and in good condition, and his returns gratifying, though we think he should increase his yield of butter per cow.

Mr. Collins' statement is full, and gives a clear account of his operations to which reference is made, though not in all respects answering the question proposed, still his statement gives a very good account of his mode of operations.

We have given this brief account of the dairy farms visited, referring to the reports annexed for a more detailed account of the operations and results of the farms and dairies. In the recommendations, we propose to the Executive Committee, for premiums, we have kept in view the general principles given in a former part of our report, especially keeping in view the relation of the owner himself, to the present condition of his farm, in giving it character, productiveness and valuable improvement, useful not only to himself but to others.

In our visit through Lewis county, we were greatly gratified with the evident advance made in farming in this county within a few years past. We do not know of a county where the improvements are more marked, and where more remunerating results have been secured by the farmers. The farmers have learned that their fine pasture land, clear and sparkling spring water, will secure to them the choicest dairy products; and now the right kind of farming, with the right kind of men, in the right place, has been secured, and with the most satisfactory results.

We are decidedly of the opinion, that the practice of visiting the farms entered for premiums is of manifest advantage. In no other way can a fair estimate be made of the farms. The reports drawn up, often with very great care, will show a very successful return for the labors of the year, and yet a personal examination may develop a state of management that would render it undesirable to present the farm before the public, as entitled to the awards of the Society. While perfection in every part of the management of the farm is not to be expected, a reasonable approximation should be required, so that the premium farm, when examined by others, will, in some of its features, at least, lead them to improve their own. We found much interest manifested in our visits, by farmers who had not entered into competition; several saying to us, had they been apprized of our visit in time, they would have been found among the competitors. We trust this practice will be continued, and as year after year rolls on, the standard of excellence will be increased, until the first premium farm of the State, shall be found to be of such a high character of excellence, that the passer-by may with truthfulness exclaim, "This farm is truly worthy of the Empire State."

We have concluded with entire unanimity, to recommend to the Executive Committee, the following farms as entitled to the premiums, taking into consideration all the matters relating to

them as contained in this report, and in the reports of the applicants:

CHEESE DAIRY FARMS.

First premium, James S. Jackson, farm of 165 acres, in the town of Turin, Lewis county, plate,..... $50 00

Second premium, Norman Gowdy, farm of 250 acres, town of Martinsburgh, Lewis county, ... 30 00

L. S. Standring, farm of 300 acres, town of Denmark, (Deer river farm,) Lewis county, special premium, .. S. Med.

Clarence Whitaker, farm 500 acres, town of Martinsburgh, Lewis county,..... Special commendation.

BUTTER DAIRY FARM.

First premium, J. C. Collins, farm of 150 acres, town of West Turin, Lewis county, plate, value,..... $50 00

Respectfully submitted,

B. P. JOHNSON,
T. S. FAXTON,
ELA MERRIAM,
Committee.

Feb. 10th. Report read and approved by the Executive Committee, and premiums awarded.

MANAGEMENT OF FARMS.

The following questions are to be fully answered by the applicants for premiums:

SOILS, &c.

1. Of how much land does your farm consist? and how much wood, waste, and improved land, respectively?

2. What is the nature of your soil and subsoil? Is there limestone in it? What rocks are found in it?

3. What do you consider the best mode of improving the different kind of soil on your farm? Of clay soil, if you have it, of sandy soil, and of gravelly soil? Answer separately.

4. What depth do you plow? What effect has deep plowing had on various soils?

5. Have you made any experiments to test the difference in a succeeding crop between shallow, common or deep plowing?

6. Have you used the subsoil plow? and what has been its effect on different soils and crops? Have you drained any of your lands? If so, what soils, and with what results?

7. What trees and plants were indigenous to your soil? Give the names of each.

MANURES.

8. How many loads of manures (30 bushels per load) do you usually apply per acre? How do you manage your manure? Is it kept under cover? or are there cellars under your barns or stables, for receiving it?

9. What are your means and what your manner of making and collecting manure? How many loads of manure do you manufacture annually? How many do you apply?

10. How is your manure applied; whether in its long or green state or in compost? From what crops or under what circumstances, do you prefer using it, either in a fresh or in a rotten state?

11. Could you not cheaply, essentially increase your supply of manure by a little extra labor?

12. Have you used lime, plaster, guano, salt, superphosphate of lime, poudrette, or any substance not in common use as a manure? In what manner were they used, and with what results?

TILLAGE CROPS.

13. How many acres of land do you till? and with what crops are they occupied, and how much of each crop?

14. What is the amount of seed planted or sown for each crop, the time of sowing, the mode of cultivating and of harvesting, and the product per acre? Have any insects been found injurious to your crops? If so, describe them and the remedies adopted. Have you made or can you give an estimate of the value of fertilizing matter taken from the soil by a bushel of wheat, estimating 20 bushels per acre?

15. What kind and quantity of manure do you prefer for each, and at what times, and in what manner do you apply it?

16. How deep do you have manure covered in the earth, for different crops and different soils? and what the difference between manures applied on surface and harrowed in and that plowed in several inches deep?

17. Have your potatoes been affected with any peculiar defect or disease, and have you been able to discover any clearly proved cause for it, or found any remedy?

GRASS LANDS, &c.

18. What kind of grasses do you use? How much seed of clover, or the various kinds of grass do you sow to the acre? At what season of the year do you sow, and what is the manner of seeding? What kinds of grass are the best adapted to lands used for dairy purposes?

19. How many acres do you mow for hay, and what is the average product? At what stage do you cut your grass, and what is your mode of making hay?

20. Is any of your mowing land unsuitable for the plow, and what is your mode of managing such land?

21. Have you practiced irrigating or watering meadows or other lands, and with what effect? What is your particular mode of irrigation, and how is it performed? Has any difference been observed in the effects from hard and soft water? If so, state the same?

22. Have you reclaimed any low bog or peat lands? What was the mode pursued, the crops raised, and what the success?

23. Have you succeeded in eradicating the weeds from your farm? if so, by what methods, and what weeds are most troublesome?

DOMESTIC ANIMALS.

24. How many oxen, cows, young cattle and horses do you keep, and of what breeds are they?

25. Have you made any experiments to show the relative value of

different breeds of cattle or animals for particular purposes, and with what results?

26. What do you consider the best and the cheapest manner of wintering your cattle; as to feed, watering and shelter?

27. How much butter and cheese do you make annually, from what number of cows, and what is your mode of manufacture?

28. How many sheep do you keep? Of what breed or breeds are they? How much do they yield per fleece, and what price does the wool bring? How many of your sheep usually produce lambs, and what number of lambs, are annually reared? How much will your sheep or lambs sell for per head to the butcher?

29. What do you consider the best and the cheapest manner of wintering your sheep as to food, watering and shelter? How many, in proportion to your flock (if any) do you lose during the winter? What difference, if any, between the fine and coarse wooled sheep in these respects?

30. How many swine do you keep, of what breed are they, how do you feed them, at what age do you kill them, and what do they weigh when dressed?

31. What experiments have you made to show the relative value of potatoes, turnips and other root crops, compared with Indian corn, or other grain, for feeding animals, either for fattening or for milk?

FRUIT.

32. What is the number of your apple trees? Are they of natural or grafted fruit? and chiefly of what varieties?

33. What number and kind of fruit trees, exclusive of apples, have you? and what are among the best of each kind?

34. What insects have attacked your trees, and what method do you use to prevent their attack?

35. What is your general management of fruit trees?

36. What other experiments or farm operations have produced interesting or valuable results?

FENCES, BUILDINGS, ETC.,

37. What is the number, size, and general mode of construction of your farm buildings, and their uses?

38. What kind of fences do you construct? What is the amount and length of each kind? And their cost and condition? Have you constructed any wire fence? If so, what has been its cost, and what its advantages, and how made?

39. To what extent are your various farming operations guided by accurate weighing and measuring? And to what degree of minuteness are they registered by daily accounts?

40. Do you keep regular farm accounts? Can you state the annual expense in improving your farm, and the income from it, with such precision that you can at the end of the year strike an accurate balance of the debt and credit? Would not this practice conduce very much to close observation, careful farming, and in the end much improve your system as well as better your fortune?

41. What is the cost per cent paid for marketing the products of the farm?

42. Give the annual receipts and expenditures of your farm?

DAIRY AND GRAZING FARMS—IN ADDITION.

Butter.—When the farm is devoted to the making of butter:

1. At what time was butter made, and from what number of cows?

2. What is the treatment of cream and milk before churning, in winter and summer—*and why?*

3. What is the method of freeing the butter from milk?

4. Do you use water in freeing the butter, or not—*and why?*

5. What quantity of salt per pound, and the kind of salt used?

6. Do you use saltpeter or any other substance in making the butter—*and why?*

7. Has any kind of salt been found injurious in making butter—if so, *state the kind, and reasons.*

8. What is the manner of packing and preserving the butter?

9. How many quarts of milk required to make a pound of butter?

10. What the difference, if any, between the milk of different cows?

11. Are your cows of the native or improved breeds, or a cross between them?

12. What are the breeds, and which have proved most valuable for the dairy?

Cheese.—When the farm is devoted to the making of cheese:

1. Do you warm all the milk at all seasons in the year or not—*and why?*

2. At what degree of heat do you set, or add rennet—*and why?*

3. Do you vary the heat at setting at different seasons of the year—*and why?*

4. What kind of rennet do you use; how prepared; by what rule do you judge of the proper time to commence breaking the curd—*and why?*

5. How do you break or make the curd fine—*and why?*

6. Do you observe a rule as to the time occupied in breaking the curd—and *what is it?*

7. Do you observe a rule as to the age of the curd when you begin to heat up to scald, and the time occupied in raising the heat—*and why?*

8. How do you apply heat in scalding; what degree is used, and how long kept applied to the curd to cook it enough?

9. Do you vary your rule in scalding at different seasons in the year—*and why?*

10. How do you determine when curd is scalded enough?

11. How do you separate the whey and curd, and what rule have you for tempering the curd for receiving the salt?

12. What kind of salt used; how much, and how do you apply it, and at what particular state of the curd?

13. How soon after applying the salt do you put the curd to press; warm or cold—*and why?*

14. What power do you press with, and how long?

15. What is the cause of the pressing cloth adhering to the cheese, and what is your remedy?

16. How do you give coloring to the cheese, inside or outside?

17. How do you produce a rind impervious to flies?

18. What kind of oil or dressing is used upon your cheese, and how is it applied?

19. What is the cause of cheese swelling, and what is a remedy?

20. Do you use the thermometer to test the degree of heat?

21. Are your cows of a native or improved breeds, or a cross between them?

22. What are the breeds which have proved the most valuable for a dairy?

Directions for preparing a statement of disbursements and receipts of farms which may compete for the prizes awarded by the New York State Agricultural Society.

On the debit side should appear the value of all animals and products, &c., on the farm at the beginning of the year, and all expenses incurred during the year, in the order following:

Value of horses on hand and purchased.

Value of horned animals on hand and purchased.

Value of sheep and swine on hand and purchased.

Value of hay on hand or purchased.

Value of grain and other products on hand and purchased.

Value of farm implements on hand and purchased.

Value of wagons and harness, &c., on hand and purchased.

Cost of repairs to buildings.

Cost of of repairs to fences.

Cost of manure purchased.

Amount paid for labor.

Value of board furnished such laborers.

Value of own time and board, at the same rate as others receive.

Value of time and board of members of family engaged in operations connected with the farm.

Blacksmith's bill.

Repairs to wagons, harness and implements.

Cost of implements purchased.

Cost of seeds purchased.

Cost of wagons, harness, &c., purchased.

Other expenses, enumerating such as are important.

On the credit side should appear the value of all animals, products, &c., at the end of the year, and receipts from all sources during the year, in the order following:

Present value of horses on hand.

Present value of horned animals on hand.

Present value of sheep on hand.

Present value of hay on hand.

Present value of grain and other products on hand.

Present value of farm implements on hand.

Present value of wagons and harness, &c., on hand.

Amount received for horses sold.

Amount received for horned animals sold.

Amount received for sheep and swine sold.

Amount received for hay sold.

Amount received for grain and other products sold.

Amount received for butter and cheese sold.

Amounts received from other sources, enumerating such as are important.

When the animal or article is contained in Dr. or Cr. side let it be so noted.

It is expected that the questions will be answered with precision and minuteness, with additional remarks if necessary for a full explanation of the management of the farm submitted; to be verified by affidavit of the applicant. The statement to be sent free of charge to B. P. Johnson, Secretary of the Society, Agricultural Rooms, Albany.

JAMES S. JACKSON'S DAIRY FARM—Turin, Lewis Co.

First Premium, $50.00.

1. Farm, 165 acres; forty acres wood land; 125 acres improved land; three acres of the improved land in road, no waste land.

2. Nature of my soil is a black loam and muck; subsoil nearly the same, but of a lighter color, and of a harder nature.

There are a few loose limestone scattering on a portion of my farm; and on one corner, I have a quarry of gray limestone. The rocks are granite, mostly blasted and made into wall, to prepare the ground for the plow and mowing machine.

3. Plow for corn in spring just before planting; like to have a coat of grass on the turf to turn under, to heat, as the corn will start more readily. I have not had any experience in clear gravel or sand or clay.

4. I plow from five to ten inches deep. I think root crops will yield better if land is plowed good depth.

5. Have not tested the difference between shallow and deep plowing; do not plow but a little at the most.

6. I have never used the subsoil plow. I have drained with open ditches, and found it to be a great benefit to my land.

7. The trees on my soil are the sugar or hard maple, bass wood, white ash, red and white beech, red elm, white elm and butternut. The plants are the leek and wild turnip, and nettle and tory burr.

8. Manure, from twelve to fifteen loads per acre; thirty bush. per load. I draw my manure daily from the stables to my field, in a green state, on my mowing land; drop in rows sixteen feet apart; leave the heaps eight feet apart. I think manure applied in this state produces a better crop than any other way I have ever applied it. I always manure a new seeded piece the winter following, for the benefit of the seed, for if applied when seeded, the crop of grain fails to fill on account of its lodging.

9. My means of making and collecting manure is from my stock; collect from 250 to 300 loads annually; apply the same.

10. Apply manure in a green state. I prefer using it in a green state for top dressing my meadows; for garden purposes I prefer having it rotted.

11. In addition to manure, I have laid four leaders under my stables, across barn, of water lime, to conduct the urine to a

tank twenty-two feet long and eight feet wide, and four feet deep; and machine for spreading the liquid. Expense, $140.

12. I use ashes on my corn when the third leaf first makes its appearance; and plaster after weeding. I have not used guano, superphosphate of lime, &c.

TILLAGE CROPS.

13. Number of acres tilled, fifteen; corn, two and a quarter acres; wheat, two and a quarter acres; peas and oats, two and a half acres; oats, seven acres; potatoes, three-fourths of an acre; carrots, one-fourth of an acre. As this is a dairying county, I do not devote but little of my time in raising grain.

14. The amount of seed sown per acre: corn, planted eight quarts per acre; plant from the twelfth to the twentieth of May. Break up just before planting, from six to eight inches deep, then cultivate with a two horse cultivator, and holes for the manure three feet apart. Use swine manure in the hill; cover manure three inches below the surface, and drop the seed and cover; cultivate and hoe the first time, pass through with the plow the second time, and hill; cut the first of September and stook; husk in the fall. Yield, fifty bushels per acre.

Wheat: one bushel and a half per acre; sow from the twentieth to the last of May. Plow in the fall, from six to eight inches deep; cultivate well with a two horse cultivator, just before sowing; sow and cultivate and harrow for the last time. Harvest just before the berry becomes hard; cut and bind and stook from seven to nine bundles in a stook.

My wheat struck with the rust, and the yield was light; product, fifteen bushels per acre, yielding only about a half a crop.

The weevil (Wheat midge) works in early sowed wheat; sow late; about the last days of May, is all the remedy I know of; they are more troublesome in early sowed than late.

I am not able to give an estimate of the value of fertilizing matter taken from the soil by a bushel of wheat.

Oats, three bushels per acre; plow land in the fall; cultivate well in the spring before sowing; sow and cultivate again, and harrow for the last time, as it leaves the ground smoother. Harvest when ripe; cut, bind and stook from seven to nine bundles in a stook. Crop light, owing to the rust. Product, thirty bushels per acre.

Potatoes —One fair size potato in a hill; plant three feet apart; cultivate with a one horse cultivator the first time, and hoe light; second time, plow and hill with a broad flat hill. Harvest when

fully ripe. Product, one hundred and thirty-seven bushels per acre. I know of no remedy for the potato disease.

Carrots.—Plow ten inches deep; sow in drills twenty inches apart; sow the first of June; weed as soon as up, and as often as the weeds trouble. Product, five hundred and fifty bushels per acre. Harvest in October.

15. I use swine manure for my corn in the hill; cover three inches below the surface; five loads per acre. I think there is nothing equal to it. This spring, as my swine manure did not hold out for my corn, I used three loads of green manure from my cow stables, and applied it in the same manner as above on several of the rows. I could see a great difference where the two kinds of manure were applied.

16. Answer for corn in No. 16 the same as in No. 14; as I do not harrow or plow in my manure, the answer the same as in No. 8. On surface I think the crop gets the strength sooner.

17. My potatoes have been slightly affected with the common rot, but no remedy.

GRASS LANDS.

18. I use timothy and clover; sow two quarts of clover and eight of timothy per acre; sow in May at the time of sowing my grain; seed and harrow, or bush once. Timothy and red and white clover are the best for dairying; white clover is natural to the soil.

19. I mow forty acres; average product, three tons per acre. I cut my grass as soon as out of the blow. I mow with a mowing machine; wilt and put up and stand until next day; open and cure and put into the barn.

20. Mowing land suitable for the plow, and clear of stone for mowing machine.

21. I have practiced irrigation. I overflow a portion of my meadows with a small stream in the spring. It increases the growth of my grass much.

22. I have not had any experience in reclaiming any low, bog or peat lands.

23. I have not succeeded in eradicating the weeds from my farm. My way is to mow the Canada thistle, and enrich the soil for the daisy, so the grass will get the start of the daisy.

DOMESTIC ANIMALS.

24. I have sixteen cows four years old and older; seven heifers three years old; nine heifers two years old; numbering in all

thirty-two; equals twenty-four old cows. Young cattle, six two years old, six one year old. Raised four last spring calves. Native cows crossed with Durham and Ayrshire. Horses. Grey Messenger on one side, and Black Morgan and Blucher.

25. I have not made any experiments with different breeds of cattle to show their relative value for particular purposes.

26. Wintering cattle. Feed my cattle in the barn, and have water in my barn yard, which I bring in pump logs sixty rods. It has been in operation six years without any repair. Size of watering trough, twelve feet in length, three feet in width. Keep my stock in the spring in the yard until the grass has got a good start in the pastures.

27. Butter and cheese made from sixteen old cows and sixteen heifers. Number of pounds of butter made, 1,112; number of pounds of cheese made, 10,331. Make butter early in spring and late in fall.

28. Sheep, twenty-eight in number; breeds, Merino cross with Bakewell and Cotswold; yield per fleece, three and a half pounds; price per pound, thirty-seven and a half cents. Raised twelve lambs. Sheep sell for $3.50 to $4.50 per head; lambs sold at $2 per head.

29. Feed my sheep in pleasant weather out in an open yard, and in stormy weather feed in the sheep barn on the best of hay. I feed no grain. I have not lost but one sheep in five years in the winter, aside from lambs.

30. I winter six head of swine. I keep the Suffolk breed; feed in the summer on whey and provender; feed in fall on corn, whey and milk; kill when one year and past; average weight, when dressed, 250 to 300 lbs.

31. I have not made any experiments as to carrots and potatoes, and other grain, for fattening. I feed carrots and provender in the spring, and provender to my milch cows; consider them all good.

FRUIT.

32. Number of apple trees, 195. One third are natural, and the remainder grafted in the branches.

Varieties.—Pound Sweeting, Rhode Island Greening, Spitzenburghs, Fall and Winter, Seek-no-further, Gilliflower, Golden Sweet, August Sweeting, King apple, Fall Pippin, Belle et Bonne, Winter and Summer Russets, Sweet Bough, Northern Spy, Talcott apple.

33. *Fruit Trees.*—Blue plum, Red plum, Red cherry.

34. *Insects.*—The worms have attacked my apple trees; they are a species of the caterpillar. When the weather is wet, take their nests from the branches with a pole, and destroy them in their nests.

35. *Management with Fruit trees.*—Trim my apple trees with a saw, as it makes smoother work; never ought to trim with an axe. Trim just before blossom in old orchards; think best to pasture in the spring, with cattle, for benefit of the trees.

36. I have made some experiments on farming operations, and have produced interesting results. I have been on my farm twenty-one years. When I came here, the fruit of my orchard was of but little use, except for cider. I have grafted and trimmed my trees, and they produce good fruit. My meadows had several large elms on them, which I have split and made into fence; stumps all cleared off for the mower. Also several rocks that I have put from one to four blasts into, and made wall of them. I have drained a portion of my land, and the improvement has been a paying one.

FENCES, BUILDINGS.

37. Dwelling—front, two story, 18 by 40 feet; wing and wood-house, $1\frac{1}{2}$ story, 30 by 40 feet; cheese house, 28 by 40 feet; work shop and hog-house, 36 by 36 feet: shop part 24 feet square; smoke and ash house, 6 by $7\frac{1}{3}$ feet, brick; cow barn, 50 by 80 feet, basement made of limestone, laid in mortar; wall, two feet thick, 8 feet high; two doors on each side, 8 feet wide, each, to pass through with team and carriage, between the cows, to draw manure from the stables. In addition, for doors for aisles fronting to the yard, 4 doors from $3\frac{1}{2}$ to 4 feet wide, and 7 feet high. In addition, for light and air for stock, have 10 windows, 9 lighted each, run on rollers, and open 3 feet 3 inches, by 2 feet and 9 inches. Five rows of stanchions, holding 63 head of cattle; frame on said wall, 50 by 80 feet, for hay and grain, covered with 16 feet siding and battened, planed and painted red and trimmed with white; floor passing through the center, 14 feet wide; bay on each side, 18 feet wide, and 80 feet in length; bays, 24 feet high in front, and 15 feet on back side; granary, 18 feet in length, 10 feet wide, lined with brick; aisle, 6 feet in width, passing from thrashing floor to the barn yard. Horse and carriage barn, 34 by 44 feet; foundation, limestone, laid in mortar; frame covered with 16 feet siding, planed and battened; painted red, and trimmed white; doors run on rollers. Sheep barn, 26 by 36 feet, all enclosed.

38. Front door-yard fence, 32⅓ yards, cast iron, cost $325; foundation, cut stone, laid in water lime. Garden fence, 25 rods; cedar posts, black ash rails, pine pickets painted white. Yard fence, in front of horse and carriage barn, 8 rods of cedar posts, black ash rails, pine pickets painted white; 4 rods of cedar posts and rail fence, in said yard, painted white. Yard fence in front of cow barn, 19 rods fence made of cedar posts; mortise and boards nailed to a center post. Barn yard paved in front of barn 27 yards by 30 yards; paved with round stone. For field fences 100 rods cedar posts and boards, 460 rods of stone wall. Remainder of my fences are constructed of rails; good condition.

39. I have no way of ascertaining any certain degree of the accurate account of the products, only what is sent to market, that is weighed and measured.

40. I keep debit and credit with all laborers; I do not keep regular debit and credit with my farm, so that I may strike an accurate balance with the farm. If we would keep debit and credit with the farm, it would prove beneficial to the farm and farmer.

41. Cost of marketing and guarantee for the same, five per cent on cheese and butter.

DAIRY AND GRAZING.

1. I do not make butter only spring and fall, and from no certain number of cows, as my cows do not all commence giving milk at once, in the spring.

2. In spring and winter warm the cream. Warm so as to have the butter come good. By churning too long hurts the flavor of the butter.

3. In spring and fall butter should be hard enough to take from the churn by hand and worked by hand. In warm weather ought to use the ladle.

4. Do not use water in freeing the butter from milk. In spring and fall it should be hard enough without using ice or water.

5. *Salt per pound.*—One-half pound of dry Ashton salt to sixteen pounds of butter, or one-half ounce per pound.

6. I do not use any substance in making butter. Pans kept sweet, and milk set in a proper place and skimmed in due season, does not need any substance in making butter.

7. Salt, supposed to have had lime mixed with it, has been injurious in the cheese. It makes dark spots in the cheese.

8. Work second time, pack in tubs or tight firkins to keep the air from it.

9. It requires ten quarts of milk for a pound of butter.

10. The milk of yellow skin cows is generally calculated to be the best.

11. Cows, native, cross with Durham and Ayrshire.

12. I have not made any experiments to show the relative value of different breeds of cattle for milk.

CHEESE.

1. I do not warm the milk at all seasons. In heat of summer do not heat; it makes the curd work away, and becomes too hard.

2. Set milk at eighty degrees of heat, as near as can be tested with the hand; that degree of heat will bring the milk in forty minutes.

3. Do not vary heat at setting. My milk room is as convenient in cold weather as warm weather.

4. I use calves' rennets, salted and stretched on a bow and dried. When used, soak several in a stone jar. When the curd has come so as to break short across the finger, it is time to begin to break it.

5. Break the curd by hand; never have been in the habit of using cheese cutters, as my cheese has always done well; fit for market every two weeks. I send as often as every two weeks, in the summer.

6. The time occupied in breaking the curd, one hour; like to have the curd well worked before scalded. If the curd is not well broken before beginning to scald, the soft or loose pieces are hardened on the outside and prevents the escape of the whey that is within them; besides it causes the curd to cling or mat together, and would make a leaky and a tender rind cheese; but if the curd is well worked it has a close and elastic rind, and it is mild and desirable, and is in demand at all times of the season.

7. Age of the curd when begin to scald, one hour. The time occupied in raising heat, thirty minutes. Do not like to raise the heat too quick, it starts an oil.

8. Apply heat by heating whey and pouring on to the curd at 104 degrees, as near as can be judged by hand, and cook one hour.

9. Do vary in spring and fall from summer; do not scald in the spring as hard, as the milk is not so rich. Cook the curd more in fall, for the milk is richer.

10. Determine by the working of the curd as to the hardness.

11. Dip the curd into a sink; whey passes off by a spout. Salt the curd when well drained.

12. Use Ashton salt; two pounds dry salt per hundred pounds of curd. Salt in the sink, when well drained.

13. Put the curd to press soon after salted, if cool enough, so as to have the curd join.

14. Press with Mr. H. Kendall's press, patented July 15, 1843. It is said a weight of twenty-five pounds gives, when the cheese is put to press, a power of two tons, and increases to more than twelve tons. Press twenty-two hours.

15. There are different reasons for the pressing cloth adhering to the cheese. If curd is put to press sour or too warm, you will find it troublesome. Remedy, keep cheese things sweet, and wash the pressing cloth as soon as taken off the cheese; wash in cold well or spring water.

16. Color cheese with annato; cut with ley made from ashes; put a little in the milk when set for inside, for outside coloring of the cheese should always be done in the grease; dissolve the best annato in water, (ley will not do,) and simmer the whole over the fire until the water is out, when the annato will unite with grease, and make a fine lively color. If whey butter is used, the coloring may be added while simmering out the buttermilk. Grease the cheese with this, and no other coloring will be needed. Apply by hand or with a cloth.

17. To produce a rind, is done by working the curd well and cooking thorough,

18. Use whey oil for cheese, applied by hand or with a cloth.

19. Cheese will often swell by heat. I think if curd is properly worked and cooked, will not trouble much.

20. I do not use the thermometer—temper by my hand.

21. My cows are native, with a cross between them; cross with Durham and Ayrshire. I think they are as good as any we have for dairying.

Farm.

1858.		*Dr.*
To	4 horses,	$600 00
	31 sheep, $3.00 per head,	93 00
	42 horned animals,	1,160 00
	6 swine, $5 per head,	30 00
	110 tons of hay, at $7 per ton,	770 00
	38 bushels of wheat, $1.25,	47 50
	25 do rye, 62½c. per bushel,	17 18
	Amount carried forward,	$

	Amount brought forward,	$
To	40 bushels of oats, 50c. per bushel,	20 00
	60 do carrots, 25c. per bushel,	15 00
	20 do apples,	15 00
	50 do potatoes, 25c. per bushel,	12 50
	Ketchum's mower improved,	70 00
	Emery's horse power, thrasher and separator, cross-cut and circular saw and cornstalk cutter, all complete,	160 00
	2 double wagons,	60 00
	2 sets double harness,	30 00
	1 set single harness,	25 00
	3 single carriages,	125 00
	2 double sleighs,	45 00
	2 two horse sleds,	30 00
	3 short sleds,	40 00
	1 ox cart,	15 00
	1 hand cart,	10 00
	2 harrows and 2 cultivators and two plows,	45 00
	7 young cattle purchased,	108 00
	cost on house for labor and paints and oils,	65 43
	cost on barns and cheese house for labor and paints and oils,	82 77
	board for painter five weeks, at $1.75,	8 75
	blasting stone for stone wall,	32 43
	drawing and laying 172½ rods of wall,	184 00
	laying leaders under stable floors, and building tank for urine, and machine for spreading the urine,	140 00
	board for mason three weeks, at $1.75,	5 25
	board for wall layers and blasters 20 weeks, at $1.75 per week,	35 00
	labor on farm,	205 79
	4 bbls. of flour, at $5.50 per bbl.,	22 00
	blacksmith's bill,	20 00
	keeping young cattle to pasture,	15 00
	repairs on wagon,	31 00
	tools for farm,	5 50
	grass seed,	6 50
	13 bushels seed oats, at 50c. per bushel,	6 50
	cheese boxes and butter tubs for dairy,	22 00
	Amount carried forward,	$

	Amount brought forward,	$
To	grain for stock,	40 00
	cheese bandage cloth,	6 30
	pork for family use,	84 00
	county tax,	28 24
	self for work, 8 months, including board,	152 00
	boy 6 months,	90 00
	family for making cheese and butter for the season, including board,	175 00
	board for hired help,	90 00
		$5,096 64

Farm.

1858.		Cr.
By	4 horses,	$600 00
	46 horned cattle,	1,155 00
	27 sheep, $3 per head, $81; 1 sheep, $7,	88 00
	117 tons of hay, at $9 per ton,	1,053 00
	5 swine, $5 per head,	25 00
	33 bushels of wheat, at $1,25 per bushel,	41 25
	190 do oats, 50 cents do	95 00
	60 do peas and oats, 75c do	45 00
	10 do corn, at 75c do	7 50
	60 do potatoes, 25c do	15 00
	105 do carrots, 25c do	26 25
	apples and cider sold,	78 00
	6 head of horned cattle sold,	166 00
	2 veal calves sold,	9 00
	sheep and lambs sold,	35 00
	95 pounds wool, at 37½c per pound,	35 62
	calf skins sold,	17 87
	pork and lard sold,	65 75
	beef and hide sold,	27 88
	keeping cattle to hay for neighbor,	61 00
	milk,	5 00
	25 bushels apples,	25 00
	pork for family use,	70 00
	6 cords of stove wood, $1,12½ per cord,	6 75
	20 do do 1,00 do	20 00
	sold wood in the tree,	3 50
	Amount carried forward	$

	Amount brought forward,	$
By	1½ cords of wood,	2 50
	labor and team work,	103 23
	farm tools sufficient for the farm,	
	Ketchum's mower, (improved,)	70 00
	Emery's horse power, thrasher and separator, cross-cut and circular saw, corn stalk cutter, all complete,	160 00
	2 double wagons,	60 00
	2 sets double harness,	30 00
	1 set single do	25 00
	3 do carriages,	125 00
	2 double sleighs,	45 00
	2 two horse sleds,	30 00
	3 short sleds,	40 00
	1 ox cart,	15 00
	1 hand cart,	10 00
	2 harrows, and two cultivators, and two plows,	45 00
	80 pounds of sugar, 12½ cents per pound,	10 00
10,331	do cheese, at 7½ cents, net,	774 82
1,112	do butter, 22 cents, net,	244 64
Cr.		$5,567 56
Dr.		5,096 64
	Farm Cr.	$470 92
To	cost on house for labor, and paints, and oils,	$65 43
	cost on barns and cheese house, for labor, and paints and oils,	82 77
	board for painters, 5 weeks, at $1.75 per week,	8 75
	blasting stone for stone wall,	32 43
	drawing and laying 172½ rods of wall,	184 00
	laying leaders under stable floor, and building tank for urine, and machine for scattering the urine,	140 00
	board, mason, 3 weeks, $1.75 per week, for building said tank,	5 25
	board for wall layers and stone blaster, 20 weeks, at $1.75 per week,	35 00
		553,63

You will readily see that the above amounts are not annual expenses, but it so happened that they were this year. I consider this a credit to the farm, instead of a debit, because it improves the farm; it clears the meadows from stone, and makes a durable fence, and the painting of the buildings preserves them, &c. JAMES S. JACKSON.

Lewis county, ss :

James S. Jackson being duly sworn, says, that the form, statement submitted by him to the New York State Agricultural Society, is true to the best of his knowledge and belief.

Subscribed and sworn before me this 29th day of Jan., 1859.

JEREMIAH SEYMOUR, *Justice of the Peace.*

NORMAN GOWDY'S FARM—MARTINSBURGH, LEWIS CO.

Second Premium, $30.

1. Three years last April, I bought this farm for $8,750, containing 250 acres; no waste land, and but thirteen acres of wood.

SOIL.

2. There are a few acres of soft blue clay in pasture, not plowed since I owned it. The soil is mostly a gravelly loam. There are some flat grey lime stones on the surface; and in the north east part of the farm a substratum of lime rock crops out. The soil is gravelly loam, from one, to five or six feet in depth, on the lime rock; a few large bolders, and some small ones scattered on the surface, which are called hard heads.

3. Once in six years, at least, this land must be broken up, cultivated with a rotation of grain crops, and manured, or it fails to produce a good hay crop. If the clay be plowed, it should be done in the fall, exposing it to the action of the weather, in winter, and thorough cultivation, when dry, in the spring.

4. An old field of twenty-eight or thirty acres, much worn, and remote from the barn, was plowed six to eight inches deep, and produced good crops of several kinds without manuring, last year.

5. On this, was my only experience in plowing eight inches deep. I did not use a subsoil plow.

6. Through muck, with a clay subsoil, I have drained land some, with good effect.

7. Beech, maple, bass wood, elm, some hemlock, were the trees,

and deer weed, nettles, leeks, adder-tongue and various others, were the plants indigenous to this soil.

8. I apply twenty to twenty-five loads of manure to the acre, without composting. Coarse and straw manure, I let lie in the barn-yard for the cattle to rest on, till fall, when it is sufficiently decomposed without previous stirring, I spread it upon the newly seeded meadow land after mowing. Stable manure, if left over summer, should be under cover; straw should not. Neither should be allowed to heat much, nor become too dry by stirring.

9. I have not made or used compost manures. To spring crops, chiefly barley, I apply green manure, by plowing it under, or thoroughly mixing it with the soil.

10. To corn, I apply a small quantity in the hill of hog manure or other kinds, if fine, as well as strong, covering with a little earth before dropping the seed. I think green manure occasions blasting or rust on spring wheat.

11. There is not muck convenient to this farm, by which to increase manures.

12. On a substratum of lime rock, and among loose lime stone, I think burnt lime useless. At a cost of $2.50 per barrel, I used three barrels of poudrette on corn and some cucumbers, with good effect. Gypsum, or plaster, I have used sometimes, but according to my experience, it takes effect on grass land only once in four or five years, and has the tendency to run it out. On such land as mine, I think it hinders corn from maturing early. On sandy land I have had no experience. If sown on grass, the effect to increase it is most apparent on land newly seeded. I have not observed the effects of guano, salt, superphosphate of lime or other fertilizers, except ashes, which I consider good.

TILLAGE CROPS, 52 ACRES, VIZ:

1. One acre—two and a half bushels of corn, sowed in drills eighteen inches apart, by a corn planter, from the first to the tenth of June. Stable manure was thoroughly incorporated with the soil by harrow and cultivator before sowing. I gave it no further tillage, though it would have been better to have gone through it with the cultivator once and the hoe twice. The growth was satisfactory, and but few weeds. About one-half was fed to the milch cows, as cut, before removing them from the summer pastures to the fall feed in the meadows. The other half was cut by the same instrument used in cutting wheat or oats, cradling across the rows, so that the fingers did not become entangled in

the stalks; set up in stooks, around a small bunch tied near the top with straw, and opened, bracing at the bottom, that more, leaning against it would stand loose, to dry and not fall, being all tied round with another band of straw a very little below the first. This is also the best way to stook corn with ears to ripen and dry. When dry, two loads were brought to the barns and placed standing, on a scaffold, not to mold.

2. *Corn in ear.*—Six acres—plowed deep, early in spring, with out any manure, pulverized thoroughly by drag and cultivator, planted six to eight quarts northern yellow small corn to the acre, without soaking the seed, in rows three feet apart one way, and two and a half the other. The cultivator, with one horse, went through it twice, both times it was hoed by hand. The product was 250 bushels, or forty-one and two-thirds bushels per acre. This corn was cut by a corn cutter, and stooked as before stated, but directly on cutting, without laying it on the ground at all.

3. *Potatoes.*—Two acres, a part of the before mentioned old field of thirty acres, plowed deep, cultivated and dragged till thoroughly pulverized on the surface, then furrowed in rows three feet apart, and the potatoes, without cutting, put two feet apart in hills, one large, or two small ones, at the rate of twelve bushels to the acre. Hoed twice; first, after the one horse cultivator, twice between the rows, as in corn; the second time, after a small plow with a mold board on each side, once between the rows. Product, 250 bushels. Very little of the potato disease or rot, the soil of gravelly loam and not manured. The tubers planted were mostly the deep red potato. A part of the ground planted with the genuine Irish cups. No great difference in the yield of the two kinds, but less rot in the cups. For the rot, or disease, I know no remedy, but choose dry land, not rich, and without manuring. I store potatoes in the cellar under the dwelling, keeping them from light, and not too warm.

4. *Peas.*—Six acres of black-eye marrowfat peas; sowed two and a half bushels to the acre; cultivated thoroughly after sowing on the furrows, then dragged and rolled the ground. Pigeons, at the time of their coming up, in just two days, thinned them very much, thus diminishing the crop, and allowing weeds to grow some. Products, 18⅓ bushels per acre, 110 bush. on the six acres. Harvest peas with common scythe, rolling them in bunches to pitch.

5. *Oats.*—Ten acres of oats on the farm, part of them on the 30 acre field, cultivated as above stated. Sowed two bushels to

the acre, without manuring. Product, 225 bushels, or 22½ bushels to the acre. Harvest oats with a common cradle, or a scythe, if there be peas intermingled, without binding. Oats would have done better on two acres of wettish land, the year before cultivated in peas and potatoes, which I sowed to spring wheat, which rusted and shrunk badly; oats along side of this yielded well.

6. *Spring Wheat.*—Six acres on the 30 acre lot, well cultivated, as I said before, by deep plowing, without manure, produced kernels of good quality, but deficient in quantity, very little damaged by the wheat midge, called weevil; China and Scotch, both, on the whole eight acres amounting to only eighty bushels.

7. *Winter Wheat.*—Eight acres of winter wheat: five of which were after peas, on turf land; three acres after barley, on land that had been plowed and cropped, three years previously in succession. The whole was covered with barn yard straw manure, partly rotted, and plowed under in part, and the rest cultivated in with the wheat when sown, two bushels to the acre. There was no apparent difference in the parts of the field thus managed. Product 100 bushels, 12½ to the acre. The variety sowed is called Soule's wheat, a white chaff and light colored kernel; but with this a small mixture of red chaff bald wheat, with a kernel rather reddish, was sowed.

It was sown about the 10th of September, was somewhat damaged by the winter, and some chess was produced on the land. Harvested about from 15th to 20th of August, with Manny's reaper and a hand cradle.

8. *Barley.*—Eleven acres; about four after corn the year before, well manured, was plowed in the spring; four after barley the previous year, manured and plowed in the spring; three acres after peas and oats on turf land, plowed in the fall, one-half of which was covered with heaps of manure and snow early in the winter, the rest by manure in the spring, all of which was well cultivated and mixed before seeding, and afterwards dragged, rolled, and sowed over with grass seed; 4 quarts of timothy, and 2 lbs. of large red clover seed, to the acre. For meadows I sow grass seed thinner than for pastures, because the grass will mature better and last longer. In pastures it need not mature, being eaten off. I sow 2½ bushels of barley, two rowed, to the acre; cut it with a hand scythe, in straight swaths; rake across them with a horse and revolving rake, in the afternoon of the same day it is cut, put it in heaps to cure before it becomes brittle. I thrash

grain, some with a flail, but mostly by hiring a thrashing machine which cleans grain for the market, especially barley. The product of the eleven acres, was 400 bushels.

SEVENTY ACRES IN MEADOW LAND, TO PRODUCE HAY.

It is mostly upland: 40 acres, long seeded, and a part of that moist land, produced about one ton of hay to the acre, on the average, ... 40 tons.

15	acres,	seeded two years, averaged two tons per acre	30
10	do	seeded one year, produced two tons, per acre,	20
5	do	of low land and irrigated, three tons per acre,	15
	Total, ...		105

Two brooks, and wash from the road were turned upon these five acres, by plowing as high as the water would run and distribute itself over the land.

I begin haying as soon as timothy is in blossom, considering it better for the land, as well as to make better hay than mowing later. I have used Ketchum's mower, from the first of its sale in this neighborhood, six years.

The grass, if not heavy, is raked and cocked the same day it is cut; if heavy, turned ever before the dew falls, and if sufficiently cured, put in the mow the next day. Otherwise, in rainy weather, seen to often, and stirred out, if likely to heat and sour. The ripening of seed exhausts the land, more than to cut early; besides the after growth, protects the root from dryness in summer, and frost-killing in winter, as well as being more abundant for feed of cattle in autumn.

ONE HUNDRED AND FIFTEEN ACRES, IN PASTURES, FOR GRAZING.

This land has been a long time seeded: arranged in three fields; two for cows on opposite sides of the buildings, west and east, and one for young horses and young cattle. All the grass land, both the pastures and meadows have been seeded with timothy and clover, except some low land, where red top and a valuable grass, called foul meadow are indigenous or natural.

There are very few weeds on the farm, but some Canada thistles, which disappear after twice cutting, in the season of haying and harvest. Two of the pastures have running brooks, and the other a spring.

FRUIT NOT GREATLY ATTENDED TO.

Seventy-five apple trees; some plums, cherries, gooseberries, and currants, sufficient for family use, no market. A few Greenings, Spitzenburghs and Pound Sweets, grafted on the old trees,

produce some fruit for use. Common fruit, this year, being unfavorable, amounted to only seventy bushels. When apple tree worms appear, we put a small charge of powder, with a wad only, in a gun, and shoot with the muzzle close to the nest, which destroys them effectively.

FARM ACCOUNTS.

They are not entered every day, but the facts and results are so noticed and recorded, from time to time, as to be reliable.

BUILDINGS.

The dwelling house, thirty feet square, with wood house attached, twenty-five by thirty feet, is occupied by a man and his wife, whom I hire to do all the dairy work, boarding themselves, for three hundred and seventy-five dollars a year, the man working on the land also when not employed about the dairy and cattle.

A cheese house, twenty-six by forty feet, having a small room with a dairy stove for making cheese, and the remainder for curing it. Soft water in cistern, hard in a well. One barn is forty by fifty feet, with a shed adjacent on the north end for storing or sheltering tools. On the south end of this barn is a cow barn twenty-eight by sixty feet, sufficient for forty cows, and used for stabling them in winter, and for milking them in summer and all seasons, whenever it is done, always under cover. Adjoining is another barn, thirty by fifty-four feet, for hay, and thirty feet of stabling for young cattle. Another barn, about ten rods east of this, thirty by forty feet, is used for hay and corn fodder. Three of the barns have floors to drive in loads and thrash upon.

A plenty of pure hard water from a spring always accessible, and water running into a trough near the last named barn.

FENCES.

A stone wall, laid up single of flat limestone, has stood well about thirty years, on the longest straight boundary line on the north. Recently two rails and caps have been put on more than half of it with cedar stakes.

Another wall, laid double, with small stones filled in between, forty rods, is falling down. The remainder of the fences, enclosing large fields, were well made of white cedar and black ash rails, staked and capped, three years ago, when I bought the farm. Cost of single wall, and of cedar or ash fence as above, seventy-five cents per rod.

FARMING TOOLS AND IMPLEMENTS.

2 sets of harness,	$10 00
1 lumber wagon,	50 00
1 lumber sleigh,	20 00
1 lumber sled,	5 00
1 plow,	5 00
1 cultivator,	6 00
1 harrow,	3 00
1 roller,	5 00
1 Ketchum's mower,	60 00
Small tools,	10 00
Total value of tools,	$174 00

STOCK ON THIS FARM IN 1858–9.

Sheep, none; near a village exposed to dogs.

HORSES.

One pair of team horses always kept here; one pair of young mares, matched, three and two years old; one last spring colt; one breeding mare; three young horses, afterwards sold.

SWINE.

Seven wintered, being a cross of the Suffolk and the native breeds. Fed on the slops of the dairy, potatoes, sugar beet, raw, and coarse grain, to fatten. Butchered at the age of 18 months. The average weight, 250 lbs.; sold at $6.00 per hundred—$105.00. Six swine now to winter and fat in 1859.

I have made no experiment with a view of reporting the comparative value of root crops and grain in feeding hogs or cattle, but have used the yellow sugar beet in feeding shoats and young cattle in the fall, and milch cows at any time in the winter and spring, considering that the best root for these purposes.

YOUNG CATTLE.

Kept ten yearling heifers, and one yearling bull, and one two years old bull, nearly full blood Durham. Kept seven calves; all the above crossed Durhams; sold seven others.

DAIRY.

On this farm are thirty-two milch cows, five of them three years old, milked one season before, one a two years old heifer, milked only this year, and one of the heifers farrow. Twenty-five of the above thirty-two are the progeny of a Durham crossed with the native breed some fifteen years. Seven I have owned three or four years, and consider them the native breed.

My Durhams are good, some of them great for milk, are easily kept, and seem to be as hardy as the natives. When turned off to fatten, they are superior in taking on flesh and becoming good beef.

All my horned cattle are stabled nights, and in stormy days, if cold be severe at any time. Buildings break off the north winds from the yard, always littered with straw in winter, the wheat straw being put there for bedding, and keeps them from treading up the ground and making the yard muddy. To all this stock I feed barley and oat straw, cornstalks and hay. They are salted twice a week at all seasons, except in very cold weather. Hard water from a spring near by. In summer the water in the brooks where they are pastured is rather soft. Shortly before the cows are "coming in" in the spring the remaining corn fodder is given them, and sugar beets, for variety, and warm bran slops afterwards.

The cows are messed in the spring, once a day, with provender, wet, and bean slop, till turned out to grass about the 15th of May.

No extra feed after this except dry hay occasionally. Products of this dairy are as follows:

	lbs.	Value.
Cheese made in spring,	833	$52 28
Cheese made in summer,	10,452	836 16
Cheese made, on hand,	520	41 60
Cheese used in family,	200	16 00
Amount of cheese,	12,005	$946 04
Butter made in spring,	300	$62 40
Butter made in fall,	400	80 00
Amount of butter,	700	$142 40
Three calves two to three weeks old, sold for,		$30 00
Four calves about six months old, sold for,		20 00
Seven calves now on hand, at $6 each,		42 00
Four skins sold at 8s. each, and 13 skins at 5s.,		12 12
Total product of this dairy—one year,		$1,192 56

Expenses to be deducted.

For boxes to each cheese, all cost,	$23 00	
12 butter tubs at 3s.6d,	5 25	
90 yards cheese bandages,	5 62	
¾ lb. annato,	75	
23 rennets used, more than produced,	3 00	
		37 62
		$1,154 95

No expense for marketing except $7.42 on 833 lbs. cheese.

MR. GOWDY'S METHOD OF CHEESE MAKING IN 1858.

The milk is strained soon after being drawn from the cows at evening, into a tin vat, surrounded with cold water in a wooden vat, enclosing the tin, to prevent it from souring over night.

In the morning the same water is drawn out and put into the iron dairy kettle to be heated while the milking is being done. Also the milk in the tin vat is skimmed, taking some milk with the cream, and put in a tin boiler, within the iron boiler of water, hot enough to cause the cream to mix with the milk, when it is put back with the new milk into the tin vat and stirred together.

If not warm enough, say eighty degrees by the thermometer, in warm weather, and eighty-five in cool, add hot water in the wooden vat to make it right.

When warm enough draw off the hot water, unless the weather be cool. The whole milk should be equally warm when the rennet is added.

If a small quantity be made hot enough to warm the whole milk, it will make the particles of butter oily, and they will be lost, by working out with the whey, or leaking out of the cheese afterwards. At eighty or eighty-five degrees the rennet is added, because if the milk is too cool the curd will be too slow in coming, also, too soft and tender, and the whey white. If the milk be too hot the curd will be too hard and tough.

We use calves' rennet, prepared by soaking two or three of them at a time, in an earthen jar, adding water and salt, keeping them under and stirred occasionally.

The curd should come in thirty or thirty-five minutes. When it settles, and the whey rises a little, is the time to commence cutting the curd, with a tin instrument, about a foot square, with divisions an inch apart.

Let it be a few minutes to harden the curd. Then cut again, some with the cutter, and break with the hands, to get the whey out of the curd properly. The whey is dipped off into the tin boiler within the dairy kettle, for heating, while the curd is worked fine enough for the scalding by the whey. This will be done more evenly by hot whey mixed with the well broken curd than by hot water under the vat. The curd is cooked enough, generally, from twenty to thirty minutes, being stirred, with a heat of ninety-five degrees in summer and 105 degrees in cool weather. By handling and dipping it cools more rapidly in a given time in cold weather than warm, but should always be

equally scalded. We know it is cooked enough when it adheres together by squeezing in the hand, and clear whey runs out.

We dip the whey and curd together in a strainer over a rack in the sink, stirring it to prevent adhesion and to let off the whey, keeping it fine to receive the salt equally. Salt is applied so soon as the curd is dry enough that the salt will not dissolve and run off in the whey. Common fine barrel salt, made at Salina, is what I use, a common sized tea cup full to fifteen pounds of curd. Half what is necessary is scattered evenly over the curd, then the whole is stirred and mixed, then the remainder of the salt, stirring and mixing again.

If the curd be not scalded enough or salted enough, or if it be too warm, it will stick to the strainer or the pressing cloth when pressed. The chief cause of this is not being scalded enough. Twenty-four hours we press with a lever press, turning the curd in the hoop, before the cheese entirely closes.

We color a little with annato, put into strong lye in a glass bottle or jar; enough in the milk to produce a salmon color in the cheese, but hardly perceptible in the curd. If the cheese be manufactured as above stated, it will have rind sufficient.

It should be buttered or greased a few days, then rubbed with hot whey, when turned daily till cured.

More annato may be added if you wish the outside colored more than within.

The cause of swelling in cheese is deficiency in scalding and deficiency in salting. Thermometer should be used some, sound judgment more.

FINAL BALANCE SHEET.

Stock on hand, February 1st, 1858.

Farm.		*Dr.*
Horses, three sold,	$295 00	
Team horses, one of them,	150 00	
Matched horses, colts,	200 00	
Breeding mare,	50 00	
Spring colt,	50 00	
		$745 00
Cattle on hand.		
Dry cows, two at $18,	$36 00	
Milch cows, thirty-two at $30,	960 00	
Amount carried forward,	$	$

Amount brought forward,	$	$
Spring calves, eleven at $8,	88 00	
Bull, one year old, $60,	60 00	
		1,144 00
Swine, seven at $4,		28 00
Farm implements (the same in value both years,)		174 00
Feed for stock.		
Hay estimated at 52 tons,	$367 50	
Coarse grain ground, 100 bushels,	62 50	
Seed corn used, 4 bushels,	4 00	
Black eye marrowfat peas, 18 bushels,	22 50	
Oats at 50c per bushel, 20 bushels,	10 00	
Spring wheat, at 10s. per bu., 12 bu.,	15 00	
Barley, at 6s. per bushel, 27½ bushels,	20 62	
Oats fed, at 4s. per bushel, 50 bushels,	25 00	
		527 12
Expenses.		
Labor paid and allowed,	$593 00	
Board do do	245 00	
Repairs, and blacksmith bills and boxes,	71 37	
Taxes,	40 00	
		949 37
		$3,567 49

Stock on hand, February 1st, 1859.

		Cr.
Farm.		
One team horse,	$75 00	
One yearling colt,	75 00	
One pair matched, 3 and 2 years,	250 00	
One breeding mare,	50 00	
One spring colt,	50 00	
		$500 00
Cattle on hand.		
One dry cow at $20,	$20 00	
Twenty-nine milch cows at $30,	870 00	
Ten yearling heifers at $20,	200 00	
One bull, 2 years old, $60,	60 00	
Seven spring calves at $6,	42 00	
		1,192 00
Six swine at $4,		24 00
Farm implements (the same in value both years,)		174 00
Feed for stock.		
Hay estimated at 70 tons, at $7 per ton,	$490 00	
Amount carried forward,	$	$

Amount brought forward,	$	$
Loads of corn fodder, two,	10 00	
Corn on hand, 50 bushels,	112 50	
Potatoes at 2s. per bushel, 125 bushels,	31 25	
Black eye marrowfat peas, 110 do	110 00	
Oats at 4s. per bushel, 180 do	90 00	
Spring wheat, 80 do	100 00	
Winter wheat, at 12s. per bushel, 100 bushels,	150 00	
Barley, at 6s. per bushel, 400 bushels,	300 00	
		1,393 75
Products sold.		
Four cows,	$95 00	
Four horses,	465 00	
Seven porkers,	105 00	
Cheese and butter,	1,088 44	
Calves, skins and apples,	78 50	
		1,771 94
		$5,055 69
Profit,		1,488 20

The farm described, lies adjacent to the small farm on which my family live. They have not been employed on those premises, or done anything in respect to their management, except in the way of board for hired men and myself.

NORMAN GOWDY.

Lewis county, ss:

Norman Gowdy being sworn, says, that the foregoing statements are correct and true, according to the best of his knowledge and belief.

Subscribed and sworn before me this 27th January, 1859.

Z. KNOX, *Justice of the Peace.*

LEONARD S. STANDRING, "DEER RIVER" DAIRY FARM.

DENMARK, LEWIS CO.

Special Premium, Silver Medal.

Answers to the questions proposed—

1. My farm consists of 300 acres, lying on both sides of Deer river, of which about twelve acres is wood land, about eighteen acres of waste (consisting of river and road), and about 270 acres of improved land.

2. About 155 acres is a clay loam, with a clay subsoil, on which

there is no rock or stone of any description; the remainder (comprising about 115 acres), is a sandy loam, with a gravelly subsoil, about twenty acres of which is underlaid with lime rock. More or less of the common "hard heads" will be found also.

3. My method of increasing the product of the 155 acres, is by the use of the Manlius plaster. On the remainder I use the plaster in connection with the manure from the stable and barnyard.

4. I plow from seven to twelve inches, the deeper the plowing the better the production generally.

5. Have made no experiments to test the difference in succeeding crops between shallow, common and deep plowing; *do not plow shallow.*

6. Never used a subsoil plow; have drained on the clay loam with very satisfactory results.

7. The trees were principally oak, maple, elm and basswood, and the plants, from report, were leeks and nettle, catnip, thoroughwort and dock, &c.

8. I apply not less than twenty loads of manure per acre. The manure is thrown out of the stable windows, is not covered, and drawn out in the winter, or early spring.

9. I get from my stables and yards, about 400 loads of manure annually, and apply the same; litter the yards liberally with the straw raised on the farm, which, with the droppings of the stock, furnish the manure used on the farm.

10. Stable manure is always applied in a green state on corn and barley ground, plowed in; the manure from the yards is heaped in the spring and drawn out after harvest and applied to the summer fallow.

11. Might perhaps increase my supply of manure, but keep so much stock, and so much of my land in grass, do not deem it very desirable.

12. Use plaster on all grass grounds and corn, with good results.

TILLAGE CROPS.

13. Tilled the past season, forty-seven and three-fourth acres, of which eleven acres was in winter wheat, ten acres in spring wheat, eleven acres in oats, eight acres in barley, six acres in peas, one and a half acres in corn, and one-fourth of an acre in potatoes.

14. Sow, per acre, one and a half bushels wheat, three bushels

barley, three bushels of peas and two bushels of oats. Sow winter wheat twentieth of August, spring wheat about the 25th of May, and barley, peas and oats, as early as the season will admit. Plant corn early in May. Put my land in prime order by the use of the plow and cultivator before sowing; harvest in the usual method; plow stubble land from one to three times in the fall, commencing as soon after harvesting as possible; also plow in the spring, for spring crops; depend upon the fall mainly to subdue my land. Plow sod land for peas and oats in the fall. Do not summer fallow generally, except when necessary to cleanse and subdue the soil. The past season the yield has been, for winter wheat, per acre, thirteen bushels; straw badly rusted and growth enough for forty bushels. Spring wheat, per acre, fifteen bushels; injured by drought; usual product twenty to thirty bushels. Barley, per acre, forty-one bushels; six acres, average forty-seven bushels per acre. Peas, per acre, twenty-two bushels. Corn, per acre, sixty-five bushels. Oats, per acre, forty-four bushels; four acres, average seventy bushels per acre. Potatoes, per acre, 260 bushels. Winter wheat injured by weevil (midge); know of no remedy. Avoid weevil in spring wheat by not sowing until about the 25th of May. Pieces sowed much earlier, have been for several years nearly or quite destroyed.

15. Apply manure (as before stated), to corn and barley; prefer fresh manure plowed in, in the spring, at the rate of from twenty to thirty loads per acre.

16. Plow in manure from eight to ten inches deep; do not apply to the surface; can run out the best meadow in three years by top dressing with stable or yard manure.

17. Potatoes not affected the past year, have been previously, by the rot; know of no cause, or remedy for it.

GRASS LANDS.

18. Use timothy; sow about twelve pounds of seed per acre; seed with wheat and barley before the last dragging, and roll. Timothy is best for dairy purposes. My grass land is natural to clover, and it comes in as much as desired, by the use of plaster.

19. Mow eighty-three acres; average product two and three-fourth tons. Cut grass in the second blow, as near as possible, with a machine; generally let it stand in the cock over night and get in the next day.

20. All my meadow land can, and has been plowed.

21. Have not practiced irrigation.

22. Have reclaimed low bog land by ditching; sowed oats and

seeded with timothy as soon as in condition, with good success.

23. Have not eradicated *all* the weeds; the most troublesome are quack grass and charlic; destroy them by summer fallowing.

DOMESTIC ANIMALS.

24. Keep four horses, two colts, forty-six cows, seventeen to twenty-five head of young cattle, cows mostly natives, with a cross of short-horned Durham, young cattle a cross.

25. No experiments as to relative value of different breeds of cattle.

26. Have good warm stables for all my cattle; feed good hay, with barley meal, to cows, in milk, and plenty of water. Consider shelter and full feeding decidedly the cheapest.

27. Made, the last season, 1,160 lbs. butter, and 15,599 lbs. cheese, from forty-six cows, of which eight were two years old, eleven three years old, and eleven four years old. For mode of manufacture, look under head of dairy and grazing farm.

28. Keep no sheep.

29. No experience on farms as to expense of keeping sheep.

30. Keep six swine, common breed; feed with whey and barley meal; kill about one and a half years old; average weight, dressed, 360 lbs. Raised twenty-eight pigs from the above hogs.

31. No experiments as to relative value of potatoes and other root crops as compared with Indian corn.

FRUIT.

32, 33, 34, 35, 36. In answer to the questions under this head, would say that we cannot raise fruit in this locality excepting red plums, gooseberries, currants, raspberries, &c. Have a young orchard of about thirty trees, natural fruit, just commenced bearing; but soon after they begin to bear, they show signs of decay and soon die; have repeatedly tried to raise apples and have uniformly failed. On the uplands, west of us two miles, where they get snow one to two weeks earlier in the fall, and later in the spring, they succeed tolerably in raising fruit.

FENCES, BUILDINGS, &C.

37. My farm buildings consist of a dwelling built of stone, 2 stories high, 22 feet by 40, and wing, 30 by 66, occupied by my family; also, a house 18 by 36, occupied by a tenant; also wood house, ice house, &c.; cheese house, 25 by 50; carriage barn, 25 by 30; horse barn, 36 by 40, loft used for hay, &c.; one cow barn, 25 by 60; one do. 25 by 46, the lower part used for stabling, and the lofts for hay; two hay and grain barns, 40 by 50; two do. 36

by 46. Three leantos to barns, two, 14 by 36; and one 14 by 40, used for stabling, and overhead for hay; stone hog pen, 20 by 30; also, corn house, hen house, &c., all built of wood, except the two of stone, and in good repair.

38. Construct mostly rail fence, staked and capped; have about four and a quarter miles; cost, when new, about fifty cents per rod, is in good condition. About fifty rods of board fence around the buildings, cost one dollar per rod.

39. To the full extent by weighing and measuring the crops, &c.

40. Do not keep regular farm accounts; cannot tell the annual expense of improvement; but can tell the income from the farm at the expiration of the year.

41. The butter and grain, &c., is usually sold on the farm; no expense. The cheese is sold and delivered about one mile distant, at an expense for cartage not exceeding three cents per hundred weight.

DAIRYING AND GRAZING.

Butter.—Under this head, I would say that my farm is devoted to the making of cheese. Butter is made, however, in the early spring, and late in the fall, when we have not a sufficient number of cows in milk, or from any other cause do not desire to make cheese. The milk is set in tin pans, skimmed when sour, and churn as often as the accumulation of cream requires; salt with Ashton salt, to the taste; use nothing else; churn at sixty degrees, Fahrenheit; pack in tubs, and sell as fast as made.

CHEESE.

1. Do not warm the milk in very warm weather, because it is warm enough without; do at other seasons.

2. Add rennet at about eighty degrees, because, from our experience, we get more cheese from milk at that temperature, than at any other.

3. In cold weather raise above that temperature, because, unless done, it will not retain the heat long enough to obtain the fullest return from the milk.

4. Use calves' rennet, salted and dried, soaked in whey when used; judge of the proper time to break the curd by the hardness; if broken too soon, much of the curd is lost in the whey.

5. First break the curd with a curd knife, then work it off with the hand; do so because the curd is injured less than by any other method.

6. When the curd is of the proper hardness, which will be from

one to two hours after the rennet is added to the milk; the curd is cut by the knife into squares of about two inches, then is allowed to stand about thirty minutes and broken very carefully with the hands, then stands about fifteen minutes and broken again with the hand, until sufficiently fine, when we commence to dip off the whey.

7. Whilst the whey is dipped off, the heat is raised by warm water under the vat, and continue raising it from fifteen to twenty minutes; do so because experience shows that the greatest amount and best flavored cheese is obtained by this process.

8. Apply heat in scalding by the use of warm water around the vat as above stated; raise the temperature to from one hundred degrees to one hundred and ten degrees; scald about one hour; stir frequently, to keep the curd of the requisite fineness.

9. Do vary the rule at different seasons of the year; do not scald as hard in cold weather as in warm; cheese, well scalded, requires less care in warm weather, than when scalded lightly.

10. Judge the curd scalded sufficiently by the color, its snow white appearance being gone; and also by compressing in the hand or between the teeth, it will give a peculiar squeaking sound, both which will be determined by observation and experience.

11. Separate the curd and whey by dipping from the tin vat into what is called a salting vat, made of wood, with a rack in the bottom over which is thrown a cloth strainer, the whey being conducted by troughs to the hog pen; the curd is salted at about eighty degrees.

12. Use Ashton salt; three pounds of salt to one hundred pounds of curd, worked in by the hand.

13. Press when the curd is about sixty degrees; if it is much below that temperature, it does not adhere as well; if much above, the flavor is less pleasant, and will stick to the pressing cloth.

14. Cannot tell the power; use one of Taylor's presses, manufactured at Little Falls; press about eight hours; turn the cheese and put on the bandage and press about twelve hours longer and remove to the table.

15. The curd put into the press too warm, will cause the pressing cloth to adhere to the cheese; in very warm weather pour on to the curd, before salting about two quarts of cold water to the one hundred pounds of curd, and it will not adhere.

16. Use no coloring inside or outside, neither on the bandage.

17. Produce a rind impervious to flies, by washing, soon after

removing from the press, with whey as hot as can be applied by by the hand, and repeated every other day for thirty days.

18. Use whey butter, applied but once, about six hours after taken from the press; stands twenty-four hours, then turned and the butter applied to that portion of the cheese not previously accessible.

19. Think the cause of cheese swelling, is the curd not being entirely sweet when put to press.

20. Use the thermometer to test the degree of heat.

21. Cows mostly natives; one, an imported short horned Durham; a few a cross with the Durham.

22. Cannot say which breed is the most valuable for dairy purposes.

REMARKS.

My farm is situated in Denmark, Lewis county, known as the "Deer River Farm." My cows are mostly of my own raising, and are, as will be seen by reference to answer 27, young, and therefore the amount of butter and cheese made is much less than would have been if they had been cows of more mature years. Think that cows of the age of the 30, whose ages are given, worth but little more than one half as much as cows from six to ten years old.

My farming tools of every description are kept under cover at all times when not in use; have a place for everything, and everything in its place.

About four acres of my farm are occupied by yards and vegetable and fruit gardens, the products of which are not included in the farm account, being consumed in the family.

Most of the expenses improving the farm and fences, are included in the amounts paid for labor in the farm account.

The difference observable in the price of hay in Dr. and Cr. sides of the farm account, is the real difference in the market value of the hay at the beginning and end of the year.

All of which is respectfully submitted.

LEONARD S. STANDRING.

STATE OF NEW YORK, *Lewis county, ss:*

Leonard S. Standring, of said county, being duly sworn, says, the foregoing statements by him subscribed are true according to the best of his knowledge and belief.

Subscribed and sworn before and by me, this 25th of January, 1859,

A. D. WRIGHT, *Justice of the Peace.*

	Farm Account.	*Dr.*
To	4 horses,	$475 00
	46 cows,	1,219 00
	17 head young cattle,	195 00
	7 hogs,	30 00
	100 tons hay,	600 00
	value of grain,	133 80
	value of wagons and harness,	135 00
	repairs to dwelling,	10 00
	do fences,	4 00
	amount paid for labor,	352 50
	board for laborers,	169 50
	own time and board,	258 00
	family labor and board,	243 00
	blacksmith bill,	30 00
	repairs to implements,	4 75
	bill of cheese boxes, salt and bandages,	59 75
	packages for butter,	2 31
	cash for plaster,	42 00
	use of implements,	20 00
	account of profit and loss,	2,721 27
		$6,704 88

	Farm Account.	*Cr.*
By	4 horses,	$475 00
	46 cows,	1,380 00
	increase and growth of cattle,	242 00
	hogs on hand,	50 00
	140 tons of hay,	1,400 00
	value of grain, &c., on hand,	684 50
	value of wagons and harness,	130 00
	growth of colts,	100 00
	cattle and hogs sold,	358 00
	hay sold,	49 00
	grain, pork and deacon skins sold,	344 86
	butter and cheese sold,	1,491 52
		$6,704 88

CLEMENCE WHITAKER—Martinsburgh—Dairy Farm.

Special commendation.

Mr. B. P. Johnson, *Secretary of the N. Y. State Ag. Society:*

Dear Sir—I herewith send you a statement of my dairy farm, situate in the town of Martinsburgh, Lewis county, New York, for the year 1858.

The farm contains 500 acres of land, of which 150 acres is wood land and roads, the balance is meadow, plow and pasture land. The soil is a uniform loam, based on the lime rock; granite stone or bolders are uniformly mixed with the soil; we plow from seven to eight inches deep, and have from deep plowing, with my mode of manuring, nearly or quite doubled the production of the farm, without the use of the subsoil plow. The timber on the farm is maple, elm, basswood, beach, white ash and butternut. Manuring: We usually put twenty-five to thirty loads of green manure to the acre, drawn directly from the stable to the field where it is to be spread, believing that to be the most productive and economical way of applying manure; no other way of making manure only by littering cattle with straw; make about 350 loads of it annually, all of which is used. Green manure applied to land plowed in the fall, where it is spread in the spring, and mixed with the soil with the cultivator and drag; that which is scraped from the yard, is drawn in the fall upon the meadow as top dressing. In regard to hauling manure directly from the stable to the field, it is no more labor to place the manure on a boat than from a heap; when once loaded, it takes no longer to haul to the field, besides being done when labor is cheap, and without injury to the land by cutting and poaching when soft in the spring. Tillage crops, from twenty-five to forty acres.

Corn from five to ten acres, one year with another; from six to eight quarts of seed to the acre; planted about middle of May; tilled with cultivator and hoe; manured as above stated; harvested by cutting by the root and stooking, saving husks for fodder; yield forty to eighty bushels per acre. Wheat sowed after corn, without addition of manure, from 1st to 15th May. Harvest, cut with cradle, yield from twelve to twenty bushels to the acre. The midge has done considerable damage to wheat for the last few years. Oats sowed on sod, without manure, from 20th April to 15th May; yield from forty to sixty bushels per acre. Barley, sown after green crop, from 15th May to 15th June; average yield about forty bushels the acre. Peas, sown on sod, from 25th May

to 1st June; average yield, thirty bushels per acre. Potatoes, plant on sod; since the disease or rot has got hold of potatoes the yield is light; know no cause or remedy.

GRASS LAND.

Timothy and clover are the kinds of grass used; sow one peck of timothy, and four to six pounds clover seed to the acre; sow in spring with wheat and barley. Usually mow about 100 acres of meadow; average crop about one and a half tons to the acre; cut with machine. Commence cutting when timothy begins to bloom; at commencement of haying, rake and cock over night, open and draw next day. The whole farm, with the exception of a few acres, is suitable for the plow.

DOMESTIC ANIMALS.

One yoke oxen, fifty cows, forty-five young cattle, nine horses. Cattle, native, mixed with Durham and Devon; have made no experiments on breeding cattle. Manner of wintering cattle: Feed all the hay and straw in the barn; water in yard brought by aqueduct, and cattle kept in stable in cold and stormy weather. The number swine kept, ten to twelve, common breed of our country; feed on whey through summer, fatted on corn in fall, and killed at the age of one and a half year old, weigh from 300 to 500 pounds each.

FRUIT.

Apple trees; 200 chiefly grafted with many different varieties. Some pear, plum and cherry trees. Manure often, and prune judiciously.

FENCE AND BUILDINGS.

One house thirty by sixty feet; two stories constructed of stone and brick; wood house, thirty by thirty; two stories, built of wood; dairy house, twenty-four by forty, of wood; hog house, thirty by forty, built of wood; corn house and granary, twenty by thirty; horse barn, thirty by forty; cattle barn, fifty by seventy-five, with basement for stable, capable of holding eighty head of cattle, built of stone, eight feet high, with doorway sufficiently wide to drive a team, upon which stands the frame, with twenty feet posts; floor runs through center, seventy-five feet long, fourteen feet wide; bay on each side eighteen feet wide.

FENCE.

Stone and turf wall, 190 rods; cost of building said wall $1.00 per rod; 220 rods of half wall, and post and board fence, cost $1.00 per rod; 400,rods board fence, cost, material and build-

ing, seventy-five cents per rod, all in good condition. The balance of fence on said farm is built of rails, in fair condition.

In regard to keeping accounts, I have a way of doing that satisfactory to myself, of which I will give you an insight: When I buy property of any kind, pay the cash for it, and when I sell property, sell for cash, so that at the end of the year, what cash there is in my pocket, belongs there as net profit, varying of course, according to the season and circumstances.

ON CHEESE MAKING.

Use for making cheese, tin vat, set in wooden vat. In regard to the vat, let me here remark first, some of the objects in view of the introduction of the vat, claiming the right so to do, being the inventor, and ordering the first tin vat made, and used for the purpose of making cheese. Some time about the year 1827, I ordered the first vat. It was made by a man by the name of Evans, in the city of Utica, Oneida county, (being a resident of that county myself, at that time,) and which is now in general use. The object of the introduction of the vat, was to have a more perfect control over the heat. In the old way of making in a tub, and heating with the whey, the curd had to be worked until a separation of whey from the curd, sufficient to dip the whey into a kettle, and then heat and pour back upon the curd, and scald in that way, which made it tedious, and more liable to waste. But by useing the vat, you can command the heat, and use as occasion requires, which, in many cases, is necessary immediately after a slight breaking, and before the whey separates from the curd.

In my opinion, it would be almost impossible to write out any rule by which it would be safe to work by at all times, and under all circumstances, in the manufacture of cheese.

It is not necessary to warm the milk in warm or mild weather; the morning's milk put into the vat with the evening's, warms the milk sufficient for adding the rennet to eighty degrees, which is warm enough at any season of the year. Use calves' rennet; take fifteen, put into a tub that holds twelve gallons, fill the same with water, put in more salt than will dissolve; add a handful or more of sage and some cloves, all of which tend to keep it sweet; soak several weeks before useing; stir every day. My rule for telling when the milk has come sufficient to commence working, is by passing the finger through; if the curd cleaves from the finger without sticking, then go to work breaking the curd, by passing the hands carefully through it until sufficiently fine, heat gradu-

ally while working, until heated to 100 degrees, by putting hot water into the wood vat, outside tin vat; when sufficiently fine, cover up; let curd stand until cooked enough to put to press; when cooked enough, cooled enough, and salted enough, it will have a good rind, and will not stick to the cloth, which occupies from one hour to one and a half; judge by feeling when scalded enough; dip whey into sink, leaving curd in vat, pouring cold water on to the curd; stir in and dip into the sink, one common sized teacup of salt to fifteen pounds pressed curd. Cheese press, Kendall's patent; press twenty-four hours; grease with lard, melted and put on warm. There are different causes for cheese swelling, namely: slack scald, slack salt; sudden, severe hot weather will make cheese swell when made properly, especially after a cool spell of weather; use no thermometer; test by feeling.

Farm.	*Cr.*
By 20,000 pounds cheese, sold at nine cents, ...	$1,800 00
2,200 pounds pork sold at six cents, ...	132 00
	$1,932 00

All of which is respectfully submitted.

CLEMENCE WHITAKER.

Dated MARTINSBURGH, January 29th, 1859.

Sworn and subscribed before me this 29th day of Jan., 1859.

E. S. CADWELL, *Justice of the Peace.*

J. C. COLLINS' BUTTER DAIRY FARM—WEST TURIN, LEWIS COUNTY.

First Premium, $50.

Hon. B. P. JOHNSON:

My farm is situated in the town of West Turin, Lewis county. Consists of one hundred and fifty acres; ninety acres are improved, the balance, sixty acres, is woodland, fenced, and turned into pasture; though heavily timbered, it yields some feed.

Soil dark loam, slightly mixed with clay. I plow eighteen acres, using it in rotation; first for oats; secondly for planting corn and potatoes; lastly for wheat, and seed it down, putting all my manure on the newly seeded ground after seeding. You will observe in this process I break up five or six acres of sward ground each year; seed down and manure the same amount, putting on the manure in the fall after the crop is taken off, or in the spring following, about thirty loads per acre.

I plow six to eight inches deep. I have tried subsoiling a piece of sandy ground without any material benefit; yet I think it would do well on worn-out land. I have known corn attain great growth on dirt taken from the bottom of a well twenty-five feet deep.

Timber is mostly hard wood, elm, maple, beech and birch, interspersed wth basswood, butternut, hemlock, and very little spruce. Alders grow along the streams.

I apply twenty-five or thirty loads of manure per acre. It is mostly stable manure. The cattle are kept in stone stables in winter, their heads towards the center. The manure is thrown out of windows on the sides made for that purpose, and remains exposed to the weather. I usually make 150 to 180 loads per year; nearly one-third is made by carting in muck and other substances to make up the amount I require. I am particular to have the manure well rotted, and the muck and weeds thoroughly mixed by shifting and turning it till thoroughly decomposed and mixed. I prefer putting it on the land in the fall, but the short seasons sometimes compel me to let a part lie over till spring; that portion should be well bushed to prevent its lying uneven and in bunches.

I have used plaster on meadow and pasture with good results. It will be found highly beneficial if sown on pasture lands. It brings in white clover in great abundance, which is natural to our soil, and producing great abundance of fresh feed.

TILLAGE AND CROPS.

I till eighteen acres this year—ten acres of oats, four of wheat, two of corn, and two of potatoes. Oats I sow in April, if the season will permit, on sward ground, three bushels per acre; harrow till the surface of the ground is thoroughly pulverized. Yield, fifty bushels per acre.

I sow wheat on land used the year before for corn and potatoes. Plow early in the spring, and let it lie till the 25th of May; then cultivate and sow one and a half bushels of Canada Flint wheat, which has previously been washed and limed; harrow it in well. I use no manure this year, the ground having been used the year before for corn and potatoes, and manured in the hill, and is rich and in good order for a crop of any kind. The reason why I sow late is to prevent the midge from injuring the wheat. The midge works most the latter part of July and the fore part of August. At this time the late sowed wheat will hardly be headed out, and before the wheat gets into the milk the insects are gone. The

crop will be fit to harvest the first of September. My crop yields twenty-five bushels per acre.

Corn and potatoes I plant after oats. The sward, turned under the year before, is now turned up thoroughly rotten. After harrowing to pieces, I furrow it out three feet apart, manure in the hill, making a shovelful of hog manure answer for three hills; put on the top an inch of dirt; drop the corn, and cover one and one-half inches deep. I hoe as much as is needed to keep the ground perfectly clear. Crop, seventy-one bushels per acre.

Potatoes have become a very uncertain crop; when they are not injured they yield bountifully. This year the crop is 200 bushels per acre. I plant three feet apart one way and eighteen inches the other; hill up so as to make a good round hill.

I use timothy and red clover seed; sow ten quarts of timothy and two of clover seed, mixed, per acre in the spring. If I find it likely to fail in consequence of drouth, I sow half the quantity in the fall after manuring the ground. In this way I never fail of having good meadows. I mow fifty acres; commence in July, when the timothy is in full blossom. I use De Wolf's mowing machine. In first part of haying, I cock up the hay the same day it is cut, if the weather will permit; shake it out and cart it into the barn the next day; but as the grass grows riper, I cut and get in the same day. I usually cut two and a half tons per acre. This year I have an unusual good crop of hay. I estimate it at 150 tons, which is three tons per acre. I have about eight acres of meadow that never was plowed. It is irrigated by a stream of soft water that flows through the barn yard, and carried in different directions by shallow ditches made by plowing a furrow. and cleaning it out with a hoe where it needs.

Weeds and foul stuff may be thoroughly eradicated by cutting them twice in the same year,—first in the full moon in June, and lastly in the full moon in August or September.

DOMESTIC ANIMALS.

I keep four oxen, thirty cows, and twenty-three young cattle, four horses and ten sheep. My stock is a cross between Devonshire and native breeds, as they are now called. These native cattle were imported from England about sixty years ago, by Henry Inman of Whitestown, Oneida county. They were good size and hardy, rather thick horn, and a light red. I breed from a half blood Devon bull, which fixes the horns in the most desirable shape and size; the color is now dark red.

The best way to winter cattle is to put them in stables made

tight and warm and well ventilated. Feed well twice a day, in the stable; let them out from two to four hours in the middle of the day; salt twice a week by making weak brine and sprinkling straw or poor hay, if you have any, and feed it out of doors in the fore part of the day, and see that the cattle have plenty of water so that all can get their fill.

I have ten Leicester sheep, all ewes; they shear five pounds per head. My hogs are of the Berkshire breed, weigh from 300 to 350 pounds when eighteen months old. I feed milk, except three or four of the last months. I cook potatoes and pumpkins; end off the last four weeks with corn.

DAIRY.

Butter is made from the first of April until the middle of December, a period of about thirty-four weeks. The milk is strained into pans and set upon racks made expressly for that purpose. It stands from thirty to forty-eight hours (as the weather may require,) when the cream is taken off and placed in Schooley's Patent Preservatory, where it is kept and set—churned every day. The butter is taken from the churn with a ladle and put into a machine to extract the milk from the butter without washing. It is then salted and placed a second time in the preservatory for twelve hours, when it is worked over and packed in tubs. I do not use any water in cleansing butter because I think salt a better purifier than water; I use the ground Liverpool salt, an ounce to a pound of butter. My butter has sold from twenty-three to twenty-five cents per pound for the last eight years; this year's butter is unsold at the time of writing; usually make 150 pounds from a cow. In the spring I commenced making Dutch cheese from sour milk under a contract at six cents per pound, but the contractor had some difficulty in New York with his customers, and ordered me to stop making. I afterwards learned from head-quarters that a good quality of this cheese could be sold in New York for $30 a thousand pieces. Twenty-five cows would furnish milk enough in a week to make a thousand. The process is simple: After the milk becomes lobbard it should be put in tubs or barrels near a fire where it will gradually become warm, when the curd will separate from the whey in the same manner as if rennet had been used. The whey is drawn out at the bottom of the tub and the curd taken out into a strainer placed in a sink, where the whey can run off; bring the corners of the strainer together so as to bring the curd in as small a compass as possible and place a weight upon it; after it has drained what it will,

place it in a hoop and press it as you would a cheese; after pressing two hours take the cheese out and crumble it all to pieces, sprinkle in a little caraway seed, work over and ball it up into balls that will weigh a fourth of a pound; these balls or cheeses are placed upon a table or shelf to dry and in about two or three weeks they will be fit for market.

It may be said that this cheese is so much gain as it takes nothing from your butter dairy, for the reason that nothing is used for this cheese except lobbard milk and carraway seed. The buttermilk and whey mixed will make plenty of feed for hogs until August, when it is always necessary to add something else to finish their fattening. J. C. COLLINS.

West Turin, *Lewis Co., Oct.* 23, 1858.

Personally appeared before me, J. C. Collins, to me known, and affirmed that the within facts are true to the best of his knowledge and belief.

Constableville, 26th day of October, 1858.

Rowland A. Reyel, *Justice of the Peace.*

Value of animals and products and farm expenses from February 1, 1858, *to February* 1, 1859.	*Dr.*
Horses and colts, four in number,	$325 00
Horned animals, young and old, 48 in number,	906 00
Sheep, young and old, 9 in number,	36 00
Hogs, young and old, 10 in number,	100 00
Hay, one hundred tons, worth $5 per ton,	500 00
Wheat, ten bushels, worth $1.25 per bushel,	12 50
Oats, sixty bushels, worth 43 cts do	25 80
Corn, bought six bushels, worth 75 cts per bushel,	4 50
Potatoes, bought thirty bushels, worth 40 cts per bushel,	12 00
Wagons and carts, harness and yokes, plows and harrows, cultivators, shovels and hoes, rakes, forks, axes, crowbars and chains, &c.,	270 75
Ice house and preservatory, built new,	100 00
Cost of repairing buildings,	13 20
Hired labor (cost of repairing fences comes under this head because it is done with the hired labor), one man and a boy all the time; extra help in harvesting, one girl all the time,	250 00
One pleasure wagon, bought,	84 00
My own time and board, and other members of the family,	376 00

Blacksmith's bill $25.15; other repairs $5.10; shoemaker's bill, $24.20,	$54 45
Hens, fifteen in number,	5 62
Bought in November last twenty-four cows,	511 00
Articles purchased at the stores,	113 15
Total,	$3,699 97

The value of animals and proceeds of every kind sold or on hand from 1st of February, 1858, to the 1st of February, 1859. *Cr.*

Horses, young and old, 4 in number,	$450 00
Cows, young and old, 54 do (24 bought in November, $720,)	1,620 00
Oxen and steers and young cattle, 27 in number,	542 00
Leicester sheep, 9 in number and wool from them, 45 lbs. at 40cts per lb., $18,	63 00
Hogs, 8 in number, $40; 1,200 lbs. of pork on hand worth $7 per cwt.,	124 00
Hay, 150 tons, worth $7 per ton,	1,050 00
Oats, 500 bushels, worth 60 cts per bushel,	300 00
Wheat, 60 bushels, worth $1,25 do	75 00
Corn, 100 bushels, worth 60 cts do	60 00
Potatoes, 400 bushels, worth 25 cts per bushel,	100 00
Beef, sold,	75 00
Butter, 4,500 lbs. sold at 21½ cts per lb.,	967 50
Dutch cheese, 4,500 in number, sold in a lump for,	50 00
15 hens, worth $5,62; eggs, 149 dozen, $22,35; chickens, 50 in number, $8.25,	36 22
Cash for labor done off the farm by the hired help and myself,	112 50
Wagons and carts and other farming tools on hand,	270 75
	$5,895 97
Leather and skins sold,	21 38
Articles manufactured in the house.	
35 yards rag carpet, 60 pair of striped mittens, 21 yards satinett, 37 yards of linen diaper,	71 25
Total,	$5,988 60
Expenses,	3,699 97
Balance,	$2,288 63
Add to credit 1 barrel currant wine, $1.50 per gallon,	46 75
	$2,335 38

DAIRY FARM OF HON. ZADOCK PRATT.

PRATTSVILLE, GREENE COUNTY.

In the Transactions of the Society for 1857, p. 89, 94, will be found the report on this farm, to which an honorary diploma of the Society was awarded. This farm was referred to in the report of the committee, as an example worthy of imitation in the mountain ranges of our state. We are pleased to receive from Col. Pratt, a statement of his farm for the present year, showing a very decided increase in every department. It would be very useful, if every competitor upon farms would favor the Society with the results upon their farms in successive years, as Col. Pratt has done. In 1857, the net profit on the farm was $460.30; and in 1858, with the same number of cows, $964.60. The report gives full details of the operations.

Gallons of milk to make a pound of butter.—We published in our Transactions for 1856, the results of our inquiries among dairymen, as to the average amount of milk required, which was stated at fourteen quarts. We have now from Col. Pratt's dairy, in 1857, twenty quarts; in 1858, sixteen and one-sixth quarts. It will be seen by examining Col. Pratt's report, that his cows, in 1857, gave him as the total receipts from the dairy, for each cow, $37.51; in 1858, $46.90.

It is not doubted that selected cows give a pound of butter from a much less quantity of milk than this; and we have endeavored to direct the attention of dairymen to the subject, to induce them, if possible, to secure a much larger return of butter than they now do. But in all our investigations, we have desired to ascertain what are the returns from a *given number* of cows, *as kept in our dairies* through the season; and the results we have given, are derived from actual experiments during the entire season. It will not do for the general farmer to be told "that undoubtedly the yield of butter, in our town or state, is a pound of butter to four or six quarts of milk;" they wish a full and reliable report of an entire dairy, with the statement of feed, keep and kind of cows, so that they may be enabled to satisfy themselves upon the subject, and improve their dairies.

We trust Col. Pratt will favor us with the result of his operations the ensuing year; and that other dairymen, will, in like manner, furnish the Society with their operations in successive years. Should this be generally done, it will do much to enable us to ascertain the best means to be adopted to secure the largest product of cheese and butter from the dairies in our state.

Col. B. P. Johnson, *Sec. of the State Agr'l Society:*

Dear Sir—You, with others, had the courtesy to view my dairy farm last year, and had it engraved as a model dairy farm; granting me an honorary diploma. In keeping the accounts for this year, for the same number of cows, fifty, I find we have succeeded so much better than we did last season, that we have beat ourselves.

The true secret of farming consists in intelligent labor; in other words, let nothing be neglected this day.

In addition to the fifty cows, we have kept the past season sixty-seven hogs and pigs, and one team, and are enabled to present you with the following statistics, and also a comparative table for the year 1857, when I employed the same farmer, in which you will see quite an improvement in favor of the present year, which we attribute to the season and greater experience in management.

I remain yours truly,

Z. PRATT.

Synopsis of account of the farm of the Hon. Z. Pratt, for 1858:

Cr.

By 8,050 lbs. butter, sold at 25 cents,		$1,924 02
By 7,403 lbs. shoats and pork, at 4 to 6½ cents,		421 08
		$2,345 10

Dr.

To paid for labor, and other incidental expenses,	$680 50	
To interest on capital invested, farm and stock valued at $10,000,	$700 00	
		1,380 50
Net profits,		$964 60

Synopsis of accounts for 1857:

Cr.

By 6,500 lbs. butter, sold,		$1,547 54
By 4,627 lbs. pork, sold at 6½ and 7 cents,		328 16
		$1,875 80

Dr.

To paid for labor, and other incidental expenses,	$715 50	
Interest on $10,000,	700 00	
		1,415 50
Net profits,		$460 30

	1857	1858
Whole number pounds of milk, from April 1st, to Dec. 1st, 8 months, lbs.,	254,736	260,450
Or, gall's.,	31,842	32,556$\frac{1}{4}$
For each cow, lbs.,	5,094$\frac{2}{25}$	5,209
Or, gall's.,	636$\frac{31}{100}$	651$\frac{1}{8}$
Average quantity per day, lbs.,	1,044	1,067$\frac{1}{2}$
Or, gall's.,	130$\frac{1}{2}$	133$\frac{7}{16}$
Average quantity per day for each cow, lbs.	20$\frac{44}{50}$	21$\frac{7}{20}$
Or, gall's.,	2$\frac{6}{10}$	2$\frac{2}{3}$
Greatest average quantity per day per cow, lbs.,	26$\frac{9}{50}$	31$\frac{1}{2}$
Or, gall's.,	3$\frac{4}{16}$	3$\frac{5}{16}$
Whole number pounds of butter,	6,500	8,050
Average per cow,	130	161
Average per day,	26$\frac{39}{61}$	33
Average per day for each cow, oz.,	8$\frac{32}{64}$	10$\frac{14}{25}$
Quantity of milk to make a pound of butter, lbs.,	39$\frac{1}{5}$	32$\frac{1}{8}$
Or, qts.,	20	16$\frac{1}{6}$
Whole number pounds of pork,	4,627	7,403
No. pounds made from each cow,	92$\frac{1}{2}$	148
Which sold for,	$6.56	$8.42
No. of pounds of butter for each cow,	130	161
Which sold for,	$30.95	$38.48
Total receipts for each cow,	$37.51	$46.90

In addition to butter and pork, we have raised 250 bushels potatoes, 100 bushels turnips, 100 tons hay, besides of corn and other crops a fair amount, as well as fattening five head of cattle, &c., &c. In attempting to raise carrots, we have been very unfortunate, in getting poor seed.

My cows are principally natives, grown here among the mountains; and while I would not attempt to underrate the value of blooded cattle, I must say that as far as my observation has taught me, I think these natives look and do better than any imported stock that has been here ten years, on the same feed. Feed makes handsome horses, fine cattle, good milkers and fat hogs; but the true test I consider to be the greatest profit from the same feed. I know some have shown more pounds of butter, made from a cow, but the number I have milked and the quality of the feed (except about four bushels of meal, shorts, and common pasturage and hay), should be taken into consideration.

I will not deny that other countries may compete with us in

the production of milk and butter; but, I will venture to say, we stand unprecedented in the reducing of it to a system.

While many theorists (who know nothing practical) have written pages in attempting to instruct in the theory of butter making, I can say that my experience has taught me that all that is necessary is good cows, good feed, good water, good climate, location and judgment; a cool place to keep your milk and butter; and, above all, a good better-half to superintend it.

I have traveled over most of this continent, making notes, comparing, adding and deducting, as I went, for the purpose of improvement; and, after seeing all, feel thankful that I was born of free white parents, in a northern clime, and one of a republican government.

Vegetation will not succeed without the three great elements: heat, air, and water. Consequently, a farm, to be good, must be so located as to receive the full heat of the sun, be protected from the cold winds, and be well watered.

Our section is suited for butter making, others for fattening purposes.

It may be said, as a general fact, that hemlock lands produce good grass, and grow better by use.

Though a mechanic, (tanner,) I have, at leisure times, turned my attention, with much pleasure, to farming. After I had used up the bark and cleared the land, making leather for the soles of the feet, I have then endeavored to perfect the system of making butter for the palate and health of mankind.

I am a plain man, but what I have seen done I can do, learning from others what I can, improve where I can, leaving for others to do better if they like or can.

"Knowledge is power." Intelligence is necessary for a farmer as well as a mechanic. If I may be allowed the expression, there is an intuitive knowledge necessary for a successful farmer; if not possessed of the right talents, he should be bred to some *salaried office*, the seas, or the army.

I am aware we have but one life to live, and find it necessary to be constantly doing. As the great object of life should be to be useful, then let no day pass without doing some good, making good use of the talents with which a kind Providence has endowed us. Each day adding something to the common stock of knowledge, so that when our days are numbered, and our epitaph written, it may be the exclamation of our neighbors, "We are better for his having lived in our day!"

This is an age of progress as well as humbug. Test all things, hold fast that which is good.

Labor is honorable; what more noble than the stalwart frame of man, the manly grasp, the cheerful eye.

REPORT ON L. D. CLIFT'S FARM—Carmel, Putnam, Co.

One hundred and sixty acres.

This is situated upon a tract originally exceedingly rugged. During the forty-four years since Mr. Clift came upon it, he has devoted himself untiringly to its amelioration; and has, at an immense expenditure of labor, (mostly that of his own hands,) succeeded in a very commendable degree, in overcoming the obstacles with which he has constantly had to contend. The vast quantities of stone, at first everywhere cumbering the ground, have been removed and disposed of by piling them in the field-walls, some of which are very massive, or by burying them in drains. When he commenced, (as he states in the report submitted by him in 1855, and published in the transactions of that year,) the lands where tillable were worn out, and much of the farm laid waste. The details which he then goes on to give, and which need not be repeated at length, show that the abstraction of the surplus moisture from the soil, by drainage; its deep and thorough pulverization; the liberal application of manures from home resources (with the addition of plaster); and an adherence, as a general thing, to the practice of never tilling a field, except with a direct view to its improvement, and greater future productiveness,—have been the chief features in Mr. Clift's farm management, which should be particularly noted for the benefit and imitation of others. To them, however, must be added the system of irrigation, pursued by him for a number of years past, the success of which bears important testimony to the frequent practicability and usefulness of this method of enlarging the yield of grass lands.

Of the one hundred and sixty acres composing Mr. Clift's farm, twenty-eight are under the plow, eight in wood, and the remainder in meadow and pasture. The committee visited it July 21, 1858, and have to report a marked improvement since 1855, (when a premium was awarded to Mr. C.,) especially in the weight and quality of the grass.

The stock upon the farm included twenty-two beeves of Short Horn blood, fattening, or then already in a condition for the butcher; twelve steers, purchased to feed, April 15th, at an ave-

rage cost of $42.50 per head; and in all 31 head of other cattle, grades or "native" red stock from the Chenango valley. The plan adopted was to sell as the animal becomes ripe for market, during the season; purchasing to fill the places of those disposed of, to such an extent as the supplies of hay and grass will permit. Like others who appreciate the vital importance of *feeding* the lands they crop, Mr. C. does not approve of selling his hay as a habitual source of income, but by transmuting it into an animal form, aims at the continually increasing fertility of his soil, and the consequent increased grazing capacity of his farm. He reports at the close of 1858, having sold, during that year, sixty-eight head, while he had forty-nine on hand, making an aggregate number of 117. Of those disposed of, forty-six, consisting of farrow cows, heifers, and three year old steers, were sold at an average of about fifty dollars ($49.57) per head; and the remaining twenty-two, steers and oxen, fattened since first of July, for a total sum of $1,355, or $61.60 each. The low prices of beef, the present season, have affected in no small degree the profits of grazing.

Mr. C.'s soil is naturally a strong one for grass and summer crops, when its strength becomes available by drainage and deep culture. His meadows in perpetual grass were originally seeded down with timothy and clover—red-top, blue grass and white clover coming in spontaneously—and the mass of herbage now presented by the different grasses is very close and fine, making an excellent quality of hay, as well as the best of pasturage, the fine natural growth being esteemed superior for feeding either cattle or sheep, or for keeping the former for dairy purposes. The first year after seeding, it has been Mr. C.'s practice to pasture, a better set of the grass he thinks being thus attainable than if the first season's crop is mowed. He thinks it, moreover, beneficial to alternate mowing and pasturing in different years on old upland meadows, and he pastures the land that is mowed as late in the spring as May, and again in summer and fall, after the hay crop has been secured. On one field this treatment has been continued for fifteen years with good success, its yield now being rated higher than ever before.

His haying Mr. C. likes to complete in June, and is scarcely ever later than the 20th July. He thinks the best hay to come from the grass first mown. He begins cutting his June grass by June 16th, and prefers to cut all quite early when in blow, except for horses, in which case the crop may be more mature. His system has been to cut in the morning and spread evenly over the

ground, care being taken to perform the latter process well, and so that the whole may be thoroughly shaken up to the air; to place in cocks invariably for the night, bearing in mind that if the weather should prove unfavorable, success will depend upon the neat and tidy manner in which the cocks are made; and it is thought necessary, unless in very unpropitious circumstances, to open these cocks but once before the curing is complete and the hay removed, as, if shaken and turned to the air and sun for a few hours, it will be sufficiently dry, and the common error of an *extreme* in this direction will be avoided. He is also particular as to the storage of the hay, not allowing it to be trampled in the stack or mow, but pitching it in, without even standing upon it, if possible, and as lightly and evenly as may be. He was formerly in the habit of mixing salt with his hay, but finding his men likely to use too much, he has of late adopted a mixture of *two parts slacked or quick lime to one of salt*, the latter being stirred in with the lime till the whole forms a powder, when ten to fifteen quarts may be dusted evenly over a load of hay at intervals in putting it up. This preparation he thinks likely to correct any tendency to acidity, while his experience proves it beneficial to the health of the stock—horses suffering from the heaves experiencing considerable relief from its use, and all his horses which are fed on it the year round, instead of going out to pasture, doing more work and wearing longer than if suffered to run at large in the fields.

The product of hay the past year was a good one, full a hundred tons having been harvested by Mr C. from forty acres, and nine loads having been taken from one lot of perhaps one and three quarters acres of clover. The committee scrutinized several samples of the crop, and were well satisfied with its appearance and condition. It may be added here, that Mr. C., after haying, endeavors to take the tour of his fields for the purpose of cutting up the weeds that may appear. This system, if thoroughly carried out, would result in a much more cleanly appearance of the meadows and pastures one ordinarily sees through the State, and more attention to the destruction of the pestilent intruders so abundant in all parts of too many farms, cannot be too earnestly pressed upon the attention of every tiller of the soil.

Allusion has already been casually made to the irrigation of a part of Mr. Clift's farm, and to its manifestly excellent effects. A stream, running through the farm, is dammed at a point sufficiently high to command a considerable area below, and the drains from

the higher lands also discharge their contents into the pond thus formed. Three main channels are permanently made to conduct the water below the dam in the desired directions, but the side conduits, which are varied from time to time, are simply furrows run by the plow, and carried at will wherever the enriching effects of the water are thought most requisite. By a gate at the dam, the flow of the water may be regulated, and a very simple contrivance is used to direct it into either of the main conduits, as desired—being merely a square box of heavy plank, without ends, the sides and bottom of which extend on the upper end perhaps a foot farther than the top. A slide is prepared to insert against the top, and further supported by cleets along the interior of the two sides, the pressure of the water without keeping it firm in position, while a long handle enables one to draw it from its place in a moment. It is a matter of importance that these main channels should be as nearly upon a level as possible, in order both that the water may have time to spread where wanted, and that it may distribute itself with equal advantage along the whole length of the stream. The eye cannot be trusted in such an operation, but a very simple instrument will answer every purpose, and the result will be far more satisfactory than if an attempt is hazarded without such precision.

Mr. Clift has been in the habit of irrigating at any and all seasons, but places a higher estimate upon the benefits of *winter irrigation* than those who have not investigated the subject would be prepared to expect. The water freezes, and as it is subsequently admitted rises to points it might not otherwise reach, and distributes itself evenly over them. His report accompanying, written in January, states that probably more than half the surface which he irrigates, was then covered by ice a foot in thickness. One can easily see how this should act as a shield from frost to the ground and the grass, protecting the latter especially from frequent thawings and freezings, and we accordingly find that "the grass in all such places is first in the spring, and grows with great rapidity." Indeed, Mr. C. obtains his summer stock of ice from a hollow in which the water can thus be admitted to a depth of from three to four feet. It is also a time to be taken advantage of for irrigation at other seasons, when the water holds in solution large quantities of earthy and other matters, owing to recent freshets. The sediment it can be made to carry as a top-dressing to the land, is well known to be an excellent application.

The sediment, also, that is deposited above the dam, as it will be found from Mr. C.'s report, he is careful to dig out to the extent of two or three hundred cart loads, as a fall top-dressing for fallow and grass lands, while the sediment is also taken from the conduits and applied to those parts of the field which the water is least likely to reach.

Mr. Clift's report, published at page 178 in the Transactions for 1855, goes into fuller details in many respects than the one here given; the two should properly be read in connection to obtain as clear a view as possible of his general management. The committee feel fully authorized not only in citing the activity and industry of his life, for the emulation of his brother farmers, but also in directing their attention to much that he has already accomplished, and is now doing, to redeem for a profitable fertility one of the most unpromising of locations, and, without the employment of capital or resources from abroad, to render the cultivation of his fields a means of adding to their future value instead of detracting from it.

It will be seen from Mr. Clift's estimates of his expenses and receipts for the past year, that he makes a net balance in favor of the farm of $3,806.50. This, however, includes no allowance for his own services, or for interest upon the capital invested; it does include a deduction of $500 for farm labor, and of $85 for mechanical expenses, such as blacksmithing, &c. The receipts include the sales of cattle already mentioned.

46 head of farrow cows, heifers and 3 years old steers,	$2,280 00
22 head of steers and oxen,	1,355 00
	$3,635 00
Also cash for apple crop,	100 00
	$3,735 00

The amount expended for cattle during the year, together with the estimated value of that in hand at its commencement, was $3,964.25. The estimated value of the stock and crops on hand at the close of the year, was $4,620.75, showing a difference for

Increased valuation at close of year,	$656 50
Add above receipts,	3,735 00
	$4,391 50
Deduct for labor, &c.,	585 00
Balance as above,	$3,806 50

It is recommended that the Society's prize for grazing farms be awarded by the executive committee to Mr. Clift.

LUTHER H. TUCKER,
WILLIAM KELLY,
B. P. JOHNSON,
Committee.

LEONARD D. CLIFT'S GRAZING FARM.

First Premium $50.00.

CARMEL, *January* 20, 1859.

To B. P. JOHNSON, ESQ:

Dear Sir—As one of the competitors for the State premium for the best Grazing Farm, it becomes my duty to give you the requisite report.

As my farm was in competition and received the second premium of the State in 1855, it will now, I think, be unnecessary to repeat much that was reported that year concerning it, by the committee who viewed it, published in the State Transactions of that year (pages 129 and 178).

It will be proper to remark that my home farm as then, contains 160 acres, and that in connection with this I have used for grazing, and *that only*, about seventy acres of my out lands; also, as then, I have continued the fattening of cattle, and the cultivation of the grasses for that purpose more and more. It is gratifying to state, and I think that the committee who viewed my farm in July, 1855, and in the same month in 1858, were well satisfied that my grass lands had improved far beyond their expectations. They can report what they think proper on that subject, but my own opinion is, that my home farm has quite doubled the value of its grasses within the last five years, and that it is capable, with the same course of management, to double its present product of grasses, in the next several years to come.

I have long since adopted the opinion, that whether you cultivate but a garden plot of land or more, and whether vegetables, fruits, grains or grasses, that deep and clean culture, under draining and irrigation, wherever to be obtained, lay at the foundation of all good and profitable husbandry of our lands. It is a sentiment with me, that no man can afford to occupy and cultivate his lands, without making them better and more productive every succeeding year. This has been my object, according to the light or ability, I have, and in doing so, I have always found it to meet my expectations, and in many instances to exceed them.

I believe that agriculture may approximate to perfection, although it may never reach it. As I promised the committee who viewed my farm this year, that I would be specific in my experience of *irrigation*, I will devote mostly the remainder of my remarks to that subject.

It is now, I think, eight years since I commenced the irrigation of my lands to any considerable extent, and I find that to get the full benefit of the system, that it requires almost daily attention in spreading the water in the alternate courses of the grounds. I have three main conduits from the dam of the stream, which remain fixed for that purpose; but the small side conduits, to spread the water, should be varied whenever it can be done to effect this purpose; about every year, or oftener if practicable, as the land nearest the conduits becomes very rich and productive in grass, and it pays well to shift their position. In doing this, I usually cut a simple furrow with the plow, and take up the sod and carry it to the manure heap, or put it upon some poorer uplands; this then makes the ground much more smooth for mowing. Again in a year or two, these small furrows will have quite filled up to the surface of the ground, with the richest kind of soil, and in all the main conduits, where the sides are thrown up to cross the hollows, it fills with the best of soils, and I clean these grounds every year, and put it upon some spot where the water has not reached. Again in the hollow of the dam, there will be deposited some two or three hundred cart loads of fine sediment, vegetable matter, and a large proportion of sand and gravel yearly, and it is somewhat surprising, that they are deposited separately and without mixture. With this, I top dress my fallow and grass lands in the fall, putting the sand and gravel upon the swales and wet grounds. A load of gravel here, is better than a load of the best manure. With proper intermissions, I turn the water upon the ground at all seasons of the year, and am careful to do this when the stream is swollen and riled with sediment and vegetable matter. I think much of winter irrigation, and keep the water almost constantly running and spreading upon the grounds.

Perhaps more than one-half of my irrigated grounds are now covered over with ice a foot or more in thickness. When frozen, the water rises and spreads most upon portions of the ground that would not otherwise be reached. It keeps the ground from freezing, and the grass in all such places is first in the spring, and grows with great rapidity. In a natural hollow upon the

grounds, where the water will stand when I wish, three or four feet deep, I get my ice for domestic use.

The ice here will freeze much thicker than at the dam. I have just secured my full supply and very fine. It is well to state that for the governing and ready use of the water, I have gates of different dimensions, placed in different locations upon the main conduits, which will conduct a larger or smaller stream of water, in the direction you may wish. They are made of simple plank, one and a half inches thick, nailed together in box form. The topmost plank, some twelve inches short from the mouth, with two upright moldings to hold the gates; near the entrance of the water, a piece of plank, with an upright handle nailed upon its center, is all sufficient for the gate.

It should be understood, that all light, porous lands are most benefited by irrigation, but it is valuable, less or more, upon all soils; provided, that the subterraneous matter be drained from them readily.

The limits of this report will not permit me to enlarge on this subject. The quantity and quality of the hay and grass which the committee saw from, and growing upon these irrigated grounds, as well as the grain crops and grasses upon the other parts of my farm, I will leave for them to say or report as they may think best, and will only say further, that if, in their judgment, I am not entitled to the first premium for the best *grazing* or *grass* farm in the State of New York, that I will aim for it until I shall get it.

Statement of farming operations and products.

Farm debit account:

To cost of cattle on the farm, Jan. 1, 1858, and subsequently purchased during the year,	$3,964 25
To cash paid for farm labor, including women serv'ts,	500 00
To cash paid for blacksmithing and other mechanical expenses,	85 00
	$4,549 25

Farm credit account:

By cash received for sales of 46 head of cattle,* to wit: Farrow cows, heifers and three years old steers,	$2,280 00

* These 46 head the committee saw on my farm in July last; 22 of these cattle averaged in their beef 500 lbs. each, and 24 averaged 700 lbs each, or only 2 lbs. short of that weight.

By cash for 22 head of steers and oxen fattened between July, 1858, and January, 1859,	1,355 00	
By cash for apple crop,	100 00	
		$3,735 00
Cattle on hand Jan. 1, 1859:		
1 beef steer for domestic use,	$40 00	
4 head working oxen,	290 00	
11 head of Durham heifers,	275 00	
22 two years old past Devon steers,	660 00	
1 bull calf, year old,	50 00	
2 milch cows,	70 00	
4 Durham heifers, full bred,	500 00	
		2,385 00
Horses:		
2 horses, matched,		300 00
Pork and poultry:		
Raised and fattened on the farm,		100 00
Crops:		
100 loads of fine cut hay, from about 40 acres, valued at	$1,000 00	
Several loads cut from fattening pastures after mowing twice,	40 00	
14 loads of corn stalks, $5,	70 00	
Several tons of straw,	50 00	
200 bushels oats at 62½c.,	125 00	
300 bushels corn at 87½c.,	262 50	
70 bushels rye at 87½c.	61 00	
18 bushels wheat at $1.25,	22 25	
8 bushels buckwheat at 62½c.,	5 00	
300 bushels potatoes at 50c.,	150 00	
Turnips,	50 00	
		1,835 75
		$8,355 75
Debtor,		4,549 25
Showing to credit of farm,		$3,806 50

An examination of the foregoing statement will show sales of 68 head of fat cattle from the farm during the last year, and that there are now upon the farm 49 head of cattle, besides pigs and poultry. I made but small profits the past season on my cattle, the prices for fat cattle ranging very low.

All of which is respectfully submitted. L. D. CLIFT.

CARMEL, *January* 29, 1859.

SOLOMON WALWRATH'S GRAIN FARM—Canton, St. Lawrence Co.

First premium.

CULTIVATED LAND UNDER FIFTY ACRES.

Visited, August 6th, by B. P. Johnson and L. E. B. Winslow, of Canton. The farm of Mr. Walwrath was entered in 1856, and examined, vide Trans. of that year, p. 87. Its principal culture then was hops, which have been mainly abandoned as not producing sufficient remuneration.

Mr. Walwrath has, in culture, crops and grass, thirty-five acres. The whole farming of Mr. Walwrath, is very neat and thorough. He believes in eradicating weeds, thorough manuring and thorough culture. He plows from six to twelve inches deep, being governed by the nature of his soil, which is mainly of a gravelly loam, with a mixed subsoil of sand and clay; no lime stone. Mr. W. believes that deep plowing, "one foot," gives him from fifty to 100 per cent increase over shallow plowing, of three or four inches. He has made experiments and satisfied himself that this is so, and that the deep plowing is of great benefit to succeeding crops; and the appearance of his farm certainly indicated complete success from his method of culture.

Mr. W. has practiced draining with manifest advantage. Mr. W. is very thorough in his manuring; he prepares a compost heap in his yard, and uses a compost of salt, ashes and plaster, to great advantage; uses his manure in a rotten or decomposed state, fifteen to twenty loads per acre. His manure is not under cover; but he is preparing sheds so that he can secure it, which he believes very important. The manure heap is covered with muck, and the urine from the barn is preserved and scattered over it with the wash from the house; 100 to 150 loads made annually; manure spread broadcast on the field. For corn, it is plowed in about six inches, and the succeeding crop wheat; and ultimately his meadows are benefited by this practice. Corn is also manured after up, and at second hoeing, with compost. Lime, plaster and guano have been used as a top dressing, but not with sufficient advantage to continue them. Plows in manure generally; is not in favor of surface manuring.

CROPS.

Wheat, oats, peas and oats, corn, beans, potatoes. Seed for wheat, two bushels; oats, two; peas and oats, two and a half; beans, two; potatoes, ten.

These crops were looking well; his beans were planted twice

as thick as usual, and were set as full as the vines would hold; and must yield double the usual crop, (the actual yield was fifty bushels and thirty-eight lbs. to the acre).

Mr. W. cultivates his wheat as follows: Sows about 15th May; plows just previous to sowing; sows broadcast; harrows lightly, both ways; applies the roller if land is in a dry state; otherwise, omits rolling until the grain is up; wheat cut when the lower joints are green; bind and shock and cap; left in field until ready for barn. (Mr. W. made a trial of some Tuscan wheat, from Patent Office, but it was struck with rust and did not succeed as well as the Scotch.)

CORN.

Plants hills in rows north and south, three and a half feet apart, and two feet the other way. As soon as corn is up, uses the cultivator, and immediately after, the hoe, to loosen soil about the hill; compost then applied around each hill, and also at second hoeing, about 1st July. Corn cut up near the ground, six hills to a bundle and four bundles to a stook, and remains until ready to husk; yield, fifty-six bushels to acre; oats fifty bushels; oats and peas, forty bushels. Since draining his land, has not been troubled with wheat midge. Seeds thoroughly with clover to diminish the wire worm; and constant tillage will ultimately destroy them. The *grub* difficult to manage. Has had no rot since draining his land among his potatoes, which are very fine. Hay; usual crop two and a half tons per acre. Six qts. timothy, and six qts. clover to the acre, for seed; sow after a spring crop and harrow lightly; white clover best adapted for dairy purposes.

Bog lands have been reclaimed by ditching; and all his crops except corn, have been raised with success on the reclaimed land; corn not tried. Weeds have nearly all been eradicated. The rule of the farm is to allow none to go seed, or grow in the corners of fences, or in the highways adjacent to the farm. The culture of corn is a good crop to subdue weeds. Canada thistles and the yellow dock have proved the most troublesome.

STOCK.

Eleven cows, four calves, two horses; cattle native; very fine lot of cows; and from the appearance of herd, should judge that they were a cross with improved bulls. Butter, 1,100 lbs. from seven cows. The butter made is first quality; Turks Island salt used, and very lightly, the principle being, that if entirely freed from the milk it will keep good; 100 apple trees of grafted fruit,

choice varieties; dozen each of cherry and plum trees. Trees are washed with soap suds, and manure applied around the roots once a year. Mr. W. has successfully cleared some very unpromising land, covered with stones, and to great pecuniary profit. He has also been successful in cultivating lands infested with the Canada thistle.

His dwelling-house is a very neat and comfortable one; his barns convenient and well arranged.

Fences.—Has 200 rods stone wall, 200 rods rail fence; and 100 rods of board fence; wall cost $1.25 per rod; board the same, and rail sixty-two and a half cents, all in good order. Weighs and measures everything raised, and keeps accurate accounts of the same, and can at any time, by reference to his books, ascertain what remains on hand, as well as what has been disposed of. His farm accounts are regularly kept, so as to ascertain all expenses and their nature; which is not only satisfactory to himself, but is deemed, and truly so, as indispensable to a successful management of a farm, as it is for a merchant; his produce finds ready market at all times at the farm.

The receipts of the farm this year,	$1,032 38
Expenditures,	551 43
	$480 95

Giving $270.95 over and above the interest on capital invested, making for the whole sixty acres, eight dollars per acre; and on the thirty-five acres under cultivation, sixteen dollars per acre; and nine dollars per acre, and interest on whole capital; and this after deducting all the expenses of the family, provisions, &c., of every kind, and deducting taxes.

This farm is in a condition most creditable to the proprietor, and is farmed with great judgment, and has been redeemed from the forest and put in the condition in which it now is, by the good judgment and skill of the owner, and presents a very handsome return for capital and labor invested. Seen in the midst of surrounding farms, it is indeed a sight most gratifying to the owner, and is, and will continue to be a lesson of instruction that is molding and will eventually redeem the farms around him. The committee are of the opinion that Mr. Walrath is justly entitled to the first premium for the best farm of less than fifty acres under culture, and recommend that the same be awarded him.

B. P. JOHNSON, *for the Committe.*

LEWIS SHERILL'S FARM—Greenville, Greene Co.

Second premium grain farm, over fifty acres.

Visited July 16th, by C. S. Wainwright, Anthony Van Bergen, and B. P. Johnson.

Farm is situated about fifteen miles from the river at Coxsackie, and contains one hundred and eighty acres of rolling land, ten acres in wood; soil, clay mixed with loam, and some gravel; generally plow about sixty-five acres; mow usually forty to fifty acres; crops, corn, oats, barley, rye, and wheat, and root crops. The entire farm is fenced with stone wall, from the stone on the farm, originally laid very thick and heavy—done by the laborers on the farm—but new walls are made from the stone of the old walls, as needed on the farm, very finely laid, of the best stone, and the residue used for draining, which is being carried on gradually. Gates with stone posts and self-balancing gate are used, and are erected on most of the lots. Bar posts, where bars are used, are fixed to stone posts, and are very durable. This farm is of mixed husbandry, grain, grazing and dairy. Crops growing when visited, were winter and spring wheat, barley, rye, corn, oats, potatoes, &c.. The general appearance of the crops was very good. The winter wheat, "bearded," had very fine large growth, and apparently but little injured by the wheat midge. Mr. Sherrill raises usually sufficient wheat for use of family. (From Mr. Sherrill's statement we regret to find that the rust and insect injured his wheat materially.)

Two fields of rye, one very good, the other fair. This is a crop usually grown in this section. Oats very good, and barley fair. Corn, one field eight acres, very fine—ground well tilled, clean, and in capital order; another field, very fair crop, but not quite equal to the above eight acres.

Spring wheat, bald, first rate crop, no insects; seeded from twenty-four to thirty acres land this year; seeds usually ten quarts to an acre, clover and timothy mixed equally in the spring; this is found to be the best way. If timothy is sowed in the fall, it interferes with the growth of the clover in the spring and summer. Feed the new seeded field in pasture the first year, and continue in grass four years. White daisy and Canada thistle are the only weeds that are prevalent. The daisy is not considered very injurious, summer fallowing destroys them; and when in meadow lands, if cut when in bloom, make good food for cattle. (We endeavored to persuade our friend that good timothy in place of the daisy, would probably do his cattle quite as much good, and would

present his farm in a much more inviting style, and would save him the necessity of so frequently breaking up his lands.) Canada thistle, mowed before seed ripens, summer fallow in July, and they are mostly destroyed. Mr. Sherrill's fields are very clean, and all parts of the farm look well—divided into lots from eight to fifteen acres, with stone wall, costing twelve shillings per rod; fences straight, no weeds growing alongside of them, all indicating a careful supervision of the owner; all the fields are in condition to use reaper and mower. The general depth of plowing, is six to eight inches; seed for wheat, one and a half bushels; oats, two bushels; rye, one bushel and one peck.

Has used guano in dry seasons, did not do well; plaster used profitably on corn and on new seeded land; plaster after grain comes up; and thinks it advantageous to the grass seed.

The wheat midge has been seen more or less for fifteen or twenty years; it is not so prevalent now as formerly, and appears to be passing away.

Butter averages ten pounds per week per cow; has had fourteen and a half per week per cow; keeps ten cows.

Draining, to a considerable extent, has been attended to, usually drains three feet deep, three feet wide, filled in with stone within eighteen inches from top of gronnd, then filled up with soil, and well covered with earth; has some in use eighteen years, remain good and effective; has 1,200 rods laid, all has done good service, and land cultivated with success. The fields which had been drained appeared to be in good order, and this plan has been successful. Pond holes, on two or three lots have been cleaned out, loose stones filled in to within eighteen inches or two feet of the top, then soil put on and cultivated with success; thus reclaiming a considerable extent of land, and making it as valuable as any on the farm.

Buildings.—Barn, 52 by 49 feet, standing upon a basement of eight feet stone walls; stable upon the ground; paved floor and gutters; stabling for twenty-two head of cattle, well littered, so as to absorb the urine; length of posts above basement, twenty-one feet, making two stories above basement; a drive in the end, on the upper floor, eleven feet above sills; two bays on each side of floor, seventeen feet wide. A straw barn in the yard, twenty by twenty-four, twenty eight feet posts, fourteen feet from barn and a bridge connecting it with the upper floor of barn, for the purpose of driving on and carrying the straw to the straw barn. Use Wheeler's endless chain horse power, thrashes on the upper floor;

grain falls to second floor, where it is cleaned and put in bins; on second floor is a hay press. Attached to barn on the south, is a tool house, eighteen by twenty; on the north, a shed twenty by twenty-four, used for corn crib and hog pen; pen floored with stone; north of hog pen is ninety feet of shed, part enclosed for stabling purposes, and part open, where water enters into a trough for cattle, and the upper part is used for storing hay. The object Mr. Sherrill had in view, in building his barn, was to make it *capacious, convenient* and *durable*, and he has admirably secured all these, and in a very economical manner. Water in the yards for stock at all times, and sheds for cattle; yards well littered with straw, from which a large amount of manure of the best quality is prepared for the farm; tool room, and all necessary arrangements for their use, in the barn; and sheds for all wagons and implements; wagon house, very complete, well arranged, with stalls for horses on the lower floor, and storage of hay above.

Garden.—One of the most attractive we have seen around the farm house; several acres are included in it, well supplied with good choice fruit—vegetables raised in abundance for family—and the beautifully arranged flower department shows that taste and beauty, as well as utility, are very properly combined in making the farmer's residence as attractive as that of any other pursuit. The dwelling is of brick, two stories, very neatly built, and very commodious, and in every respect worthy of this farm; shrubbery around it making it a very attractive place. Dairy house and arrangements very good.

We were greatly gratified with the appearance of this farm as a whole; its management appeared judicious, and the prosperous circumstances of its owner, who tills with his own hands, shows that, after an occupancy of many years, he has no occasion to say that farming won't pay, or to sell out and seek the cheap lands of the west. His well spread table, with all that was necessary and desirable, showed that the farm and the garden here gives the needed returns; and his well furnished house shows that here taste and refinement dwells.

From Mr. Sherrill's statement, we learn that the value of his stock, &c., and expenditures for the year, amounted to $3,921 00
Value of stock, &c., and receipts of farm, 4,570 00

Leaving to credit of farm, $649 00

We consider this statement, taking into account the season, a very fair return.

Mr. Sherrill has not kept regular farm accounts—as we think every farmer should—in no other way will he be enabled to ascertain with certainty the progress he is making, and when to change his system of management. We would recommend him to commence this without delay, not doubting that his first year's experience will give him abundant evidence that he has a sufficient reward for so doing.

We give, in justice to Mr. Sherrill, some statements from his report as to his method of farming.

Deep plowing is deemed most advantageous.

Usually applies forty loads of barn-yard manure to the acre. Manure kept partly under cover; 250 loads made annually; apply that, and usually purchase in addition fifty loads. On corn, manure applied in green state—distributed on the surface in a decomposed state, after sowing, in the fall. Plaster used on grass lands and corn to good advantage. Lime and guano on corn with satisfactory results.

Corn, (seed) six quarts to the acre, on sod land broken up in the spring; plowed once; harrowed well; planted three feet apart; manured in the hill, either with a compost prepared the year before, or phosphate of lime or guano. Hen manure used frequently, mixed with plaster. Plant as early after 15th May as season will admit. Usual yield, fifty bushels per acre. Cut up corn after glazed; remains in shock until fully cured to crib.

Winter wheat sown after barley—middle of September—fine growth of straw, but the rust and insects made a light crop. Spring wheat after corn, sowed 20th April; yield, twenty-five bushels per acre. Oats and barley after corn; two bushels seed per acre; plow once and harrow; leave grain in swath or gavel after cutting, till sufficiently cured; draw it in without binding. Reason of curing in gavel, as some of the grain cut by Manny's reaper, and the grass is cut with the grain and needs curing. Yield of oats, forty bushels; barley, twenty bushels. Rye after oats and barley; five pecks seed; cultivated same as oats and barley. After rye, seed with clover and timothy, five quarts of each to the acre, and usually apply a dressing of plaster. Decomposed manure for winter grain, applied on the surface and harrowed in in the fall; for corn, decomposed manure in the fall, and green manure on the surface plowed under.

Potatoes have been diseased; no remedy discovered.

Grasses.—Best for dairy are the natural grasses—meadow hay, clover and timothy; yield, about one and a half tons on an ave-

rage per acre. Cut the grass before the timothy is out of blow; cut in the forenoon, cock in the afternoon, and next day draw in barn; late in season cut and draw in same day.

Stock.—One yoke of oxen, ten cows, thirty young cattle, five horses. Cattle, cross Durham and native. Cattle stabled in winter; fed good oat and barley straw, and hay; water in yard; cattle turned out a few hours in the yard.

1,250 pounds butter, and 1,000 pounds cheese from ten cows. Butter made in ordinary way (without water to cleanse); Liverpool salt used. Swine, ordinary breeds of the county; milk and whey during summer; use of orchard in the fall until apples are gathered; then penned and fed corn; twelve to kill this season, averaging 150 pounds each at six months old.

150 apple trees—grafted fruit mostly—one acre to cherries, plums, pears and peaches.

Farm buildings as described in report.

We recommend the second premium of $30 to Mr. Sherrill.

B. P. JOHNSON,
C. S. WAINWRIGHT,
A. VAN BERGEN,
Committee.

H. DEVEREUX'S FARM—Flint Creek, Ontario County.

Visited July 9th, by James O. Sheldon, Wm. Johnson, V. P., and B. P. Johnson.

Mr. Devereux's farm is situate on the turnpike from Geneva to Canandaigua, about six miles from Geneva. The farm is very pleasantly and advantageously located in the midst of a good farming region, which has long produced crops of wheat, as well as other varieties of grain. Soil generally *clay and loam*, some sandy loam and some limestone on part of the farm. Fifteen acres of the land in meadow, twelve in pasture, seventeen in wood, fifty-six under culture.

Wheat, "winter," sixteen acres, spring wheat fifteen, corn five, potatoes one, oats six. The wheat, both winter and spring, looked remarkably vigorous. The Mediterranean for winter; and so far as could be ascertained, no signs of the wheat midge in either field. The white wheat has suffered much from the insect; and for the past six years the Mediterranean has been sound and generally good. *Seed raised on the farm.* The average of crops of wheat have been, before draining, from five to ten bushels per

acre; since draining, from twenty-five to thirty bushels per acre; last year, from seventeen to eighteen bushels. Grass lands have been equally benefited from draining.

Summer fallow for wheat; does not do well after oats. Sow barley when lands are to be cleaned of foul weeds, and follow with wheat, which has done well since the lands were drained. Manure applied on surface before sowing, and dragged in. This is considered preferable to plowing in. First crop on drained land has usually paid expenses of drainage, in addition to expense of cultivation. Gale's spring wheat cultivated; good crop; some parts of the field not sufficiently drained, and the crop there deficient. Manures from barn-yard and leached ashes for barley and wheat; lime not much used, but beneficial when used; guano about 100 pounds per acre on wheat last year, and did well; the increase not given us. Clover seed good crop last year.

Rotation of crops—wheat every two or three years in rotation. Harvest grain mostly with cradle, and grass with scythe; reaper and mower not owned, and not used to any extent; satisfied with the cradle and scythe on this farm.

Potatoes not free from disease; the *black potato* has suffered less than any other variety.

Most of this farm is tile-drained, and with very great success. The proprietor deems this the cause of his success in the main. Drains generally two and a half feet deep, which are deemed sufficient for this land, costing thirty-one cents per rod.

Seventeen head of cattle, five horses, and swine. The Durham grade stock on the farm. These are preferred and deemed most profitable.

Buildings.—Neat and tasty dwelling, yard and garden, workshop and dairy, corn house, carriage house, horse barn, hay barn, grain barn, shed to hay barn, sixty-four feet long. These buildings adjacent to dwelling house, and neatly and tastefully arranged. Tenant house and grain barn and shed.

Work on the farm performed by horses and oxen—generally by horses.

Young orchard of apples—fruit not promising.

Fences, post and board generally, and in good order.

The grain and grass fields generally very clear of foul weeds. The *wild mustard* and *steincrout*, so destructive to wheat crops, have been eradicated; some Canada thistles; but these are kept under by mowing carefully; white daisy to some extent eradicated

by summer fallow and hoed crops; but still there remains more than is desirable.

Farm accounts are kept so as to determine the relative value of different crops upon the farm. The farm is worked by a tenant upon shares—crops divided—so that the proprietor is not present to direct all the operations. The farm is in very good condition for a farm thus managed, and but few farms are to be found where more neatness and order prevail in all its departments.

This is a very attractive farm, and appears upon the whole to be well managed and deserving commendation.

Mr. Devereux has not furnished his farm statement, as was expected, as from that we should undoubtedly have had a full account of his operations and the products of his farm for the past year. We deem it proper to give our report as the committee of the Society, and express our regret that a report should not have been received of this farm, possessing as it does so many excellent things connected with its management.

B. P. JOHNSON,
WM. JOHNSON,
JAMES O. SHELDON,
Committee.

[From the Genesee Farmer, May, 1858.]

ROBERT J. SWAN'S FARM.

Premium farm of the Empire State.

The New York State Agricultural Society, at its last annual meeting, awarded the first premium of $50 for the best grain farm in the State, to Robert J. Swan, of Rose Hill, near Geneva, N. Y. The report of the visiting committee has not yet been published; but a recent visit to this magnificent farm, enables us to allude to some of the principle features in its management.

The farm contains 344 acres, beautifully located on the banks of Seneca lake, about three miles from Geneva. The soil is a clayey loam, forming a part of the ridge, which extends from the Seneca river, to the southern borders of the county. The summit of this ridge abounds in springs, which render the lower land wet and unproductive. When, several years ago, Mr. Swan purchased this farm, the crop of wheat was so poor that a portion of it was plowed under in the spring, and that which was left averaged only five bushels per acre.

Mr. Swan sowed only six acres of wheat the next year, being determined to sow only as much land as he could get into proper

ROSE HILL FARM. R. J. SWAN 1853 *As surveyed by W. R. HOPKINS Civil Engineer.*

Lith. of Harry E. Pease 518 Broadway Albany N. Y.

condition. These six acres were thoroughly underdrained and summer-fallowed, and they produced more wheat than had been obtained from forty acres the previous harvest!

It was evident that though the land been hard run, and was very foul, yet the soil was naturally good, and needed only good cultivation to make it very productive. The improvement of a three hundred acre farm is not an easy task. It requires no little judgment, perseverance and skill. Mr. Swan proved himself fully equal to the occasion; with good judgment, great practical skill, abundant capital, and the most indomitable energy, he vanquished every difficulty with a rapidity which we have never seen equalled.

Underdraining was the first thing to be done. He laid 16,000 tiles the first year. The next year, between the first of August and the first of December, he laid over *seventeen miles* of drains. He reclaimed twenty-four acres of swale land that had hitherto produced nothing but aquatic grasses unfit for hay or pastures, and which are now exceedingly fertile. The work of improvement has gone bravely on from that time to the present, until there is not a wet spot on the farm. There are over *sixty-one miles* of underdrains on the farm, or an average of sixty-three rods to the acre. On the higher and wetter portions of the farm, they are laid about twenty-seven feet apart, and from two and a half to three feet deep.

The cost of draining has been about $19 dollars per acre. The drains were dug by contract, at twelve and a half cents per rod; laying the tiles and filling the drains with plows, cost three cents per rod; average cost of tiles and cartage, thirteen cents per rod; total cost, twenty-eight and a half cents per rod. This is much cheaper than such work usually costs, where it is done on a small scale and by inexperienced hands.

That such an expenditure for underdraining has been exceedingly profitable, no one can doubt who knows what the farm was when it came into Mr. Swan's possession, and what magnificent crops it now produces.

While underdraining has formed the basis of Mr. Swan's improvements, it would be erroneous to ascribe his splendid crops to underdraining alone. The land is thoroughly cultivated by means of summer fallows and hoed crops. It is not over-cropped with cereals; clover is sowed with an unsparing hand; about nine tons of plaster are sown each year on the pastures and meadows; nearly everything is consumed on the farm, except wheat,

and, in addition to this, a considerable quantity of oilcake is fed to cattle and sheep. In this way a great quantity of manure is made, and it is *good manure*, not rotten straw.

Let us look into the barn-yard, or rather into one of them, for there are three on the farm. No need to turn up your pantaloons—there is abundance of straw to absorb all the liquid, and the yard is a picture of comfort and contentment. What a magnificent flock of sheep! Eighty well-bred Leicesters, and as fat as good clover hay and eighteen ounces of oilcake meal per day can make them.

"What will they weigh?"

"They will average over 140 pounds live weight."

"No doubt of it. This would make their dead weight about eighty pounds."

"How do you get at it?"

"The English rule is to divide the 'fasted live weight' by seven, and call it quarters; so that your sheep, if they weigh 140 pounds alive, would dress twenty pounds per quarter, beside the rough fat. Lean sheep will fall short of the dead weight indicated by this rule, and very fat ones will exceed it. There are few sheep in this country that will come to the standard, but I will bet a life subscription to the Genesee *Farmer*, against the poorest sheep in the yard, that these sheep will go ahead of it. The butcher gets the advantage of good feeding, if the farmer does not."

Let us go into another barn-yard. What comfortable, open sheds these are for cattle. They are worthy of good cattle, and here are cattle worthy of the sheds. Look at this lot of eight steers, two years old this spring. They average 1,075 pounds live weight; have had one quart of oilmeal per head daily, since last fall.

"What do you give for oilcake?"

"Twenty-seven dollars per ton."

"How do you manage to get it at so low a figure?"

"By paying the cash for it, and buying it at a time when navigation is closed, and there is little demand for exportation."

"Emery's *Journal of Agriculture* says, that the American oilcake is about as nutrious as old chips; that all the nutriment is pressed out of it by the present improved presses. What do you say to that?"

"Look at the cattle and sheep, and let *them* answer. Do they look as if they had been fed on sawdust? Come up to the other

yard, and look at the ninety yearling sheep that have had half a pound each oilmeal per day during the winter, and see if they do not tell a different story."

"You say your two years old average 1,075 pounds. How do you know their exact weight?"

"I have one of Forsyth's hay scales, manufactured in Rochester, and find it very useful for weighing cattle, sheep, &c., as well as for many other purposes. No farmer should be without one."

It is impossible to help admiring the order, system, regularity and thoroughness, with which everything is done on this model farm. There is a place for everything, and everything is in its place. One cause of this is to be found in the fact, that Mr. Swan has on his farm, several cottages which he rents to his teamsters and other laborers. This gives him steady, married men that he can trust. They are hired by the year, at lower rates than transient hands; and the plan is found advantageous to both parties.

Let us take another look at this fifty acres of wheat before we go. It will be some time before we meet with such another field. It is only too good. It was closely pastured last fall, and until the first of January; and yet, now it is bigger and better than any wheat we have seen elsewhere this year, though the wheat crops generally look well this spring. Look at that wheat, and you will conclude with us, that underdraining, good cultivation, plenty of clover, high feeding and heavy manuring *will pay.*

THE DAIRY—BUTTER MAKING.

We give the annexed article on butter making, prepared, we believe, by a Chenango county dairyman, and published in one of the county papers. There are many suggestions in it of importance—and the manner of making butter, as recommended, would, if generally adopted, secure to us a far more acceptable article, than is now usually found upon the tables, even, of the most wealthy. It is a fact that cannot be disguised, that there is much butter sent to market from our dairies of a very inferior character; owing, mainly, to the want of proper care and attention in its manufacture. If, as is stated in the annexed article, only one-fourth of the butter made in this State is of prime quality, the loss to the dairymen and to the State, from the difference in price between good and poor butter, is immense, and should be arrested. The quantity of butter made in this state, as given by the last State census, was 90,293,073½ lbs., of which 22,573,268¾ lbs. may be estimated as prime butter, leaving 67,719,804½ lbs. as inferior. Estimating the average price of prime butter at the dairy, at twenty-two cents per pound, and the ordinary butter at nineteen cents per pound, which, it is probable, is not far from the difference at which it is sold, taking the State at large, we have a loss on this inferior butter, of upwards of two millions of dollars in a single year, arising mainly from neglect or want of knowledge on the part of the dairymen, in manufacturing the butter. If it should be urged that the difference in price is not as large as stated, in consequence of a practice that has prevailed of making the good butter sell the poor, still, at the lowest estimate, there must be two cents per pound difference, which would give a loss of nearly one and a half million of dollars. This, certainly, is too much for the dairymen of our State to lose; and their attention should be more specially given to the dairy. In every section of our State, there are dairymen, the uniform and excellent character of whose butter secures the highest price, and if the others will but give their time to ascertain the means by which this is accomplished, they, too, may make as good an article, and receive an equal price.

We ask the attention of our dairymen to the article annexed, on *butter making.*

BUTTER MAKING.

To make fine, high-flavored butter requires a very nice process, one which, in reality, but few, in comparison with the number engaged in the business, carry out in its manufacture. Nice butter is a dainty luxury, which most of us appreciate; I will not say all, for if all did, I am sure there would not be much poor butter found in our markets. Probably not one-fourth of all the butter that goes to market is of a prime, high order; and to this fact must be attributed the exceeding high price we get for our prime butter, and in turn, the high price has a tendency to raise the price of the poorer grades; so that in consequence of there being so much poor butter, we have to pay too much for good, and, as will be seen, too much for the poor. Now, if all our butter was prime, we should have neither the high nor the low-priced, but a mean between the two. To make butter in its highest state of perfection, many things are to be considered. First, the cows should be selected with great care, and well cared for winter and summer. The field which they graze in should not be too high, neither to low; if too high, there is not so much heart in the grass; it is apt to be poor and stinted, and too wearisome for the cows to travel over. If too low and wet, the grass is flashy and the milk will be too many parts water. Warm, dry lands are the best for the dairy purposes; yet low lands are very beneficial during the dry season. Cows will do better not to change them from one field to another, unless from a day to a night pasture. Cold water and cool, dry cellars, or milk-houses, are necessary. Close attention must be paid to the milk that it does not stand too long, and milk things must be scalded daily. Strain the milk all together in a tin vessel sufficiently large to contain one milking, and stir the milk a little before putting it into pans or pails. The milk of some cows is very rich, while the milk of others is very poor, consequently the latter will sour first; and some will be very yellow, while others is very light colored; hence we readily discover the necessity of straining the milk altogether, that it may be of a color, and changed at the same time, and it will make enough more butter to pay the trouble. Set the milk in a cool place, and whether in milk house or cellar, fresh air must be supplied in the cool of the day.

As soon as the milk changes a little, or even before, pour off the cream, and about one half of the milk, into the churns or tin vessels at night, when it can be done without injury to the cream, as early in the morning is the best time for churning. The cream

should be well stirred together on putting into vessels or churns, and, in ordinary weather, may stand a few hours before churning. It is very necessary indeed that the churns should be kept perfectly sweet; and to do this effectually they should not be made of soft wood, but of the best of oak. The flavor of butter is often injured by cream standing too long in bad churns, and the maker not know the cause of it. A wire screen should be used to cover the cream in the churns instead of the lid, as the exclusion of the air has a tendency to make the butter taste of the churn. The temperature of the cream for churning depends somewhat on where the churning is done. Sixty-two is about right in summer, and in cold weather sixty-four or five. If the cream is too warm, reduce the temperature with cold water, and if too cold raise the temperature by heating the vessels containing the cream in hot water; by no means put the hot water into the cream. Pour in plenty of cold water while the butter is gathering. The butter should be washed perfectly clear of buttermilk before salting. Ashton salt is the best for butter. It should not be salted sufficiently at the first working; by a handful, say, to ten or fifteen pounds. After working the salt through the butter properly, let it remain in the house till the next morning; work it over again, at the same time adding a little more salt, and it is ready for packing in the firkin, which should not hold over eighty pounds, to suit the market. The salt that is put in the last time of working, will dissolve after it is packed in the firkin, and instead of the butter sticking to the trier, a nice, clear sweat will rest on the back of the same, which pleases the buyer exceedingly, and at the same time he exclaims, "That is right, good enough to eat with our warm biscuit and honey."

CHEESE MAKING.

We give a very excellent article on "Cheese making," by T. Rowlandson, originally published in the Mark Lane *Express*. It gives an historical notice of cheese making, composition of milk and cheese, the rennet used, coloring matter, Cheshire cheese, its mode of manufacture; Gloucester cheese making; new cheese; skim milk cheese; cream cheese; Parmasan cheese; Neufchatel and Gruyere cheese, and Dutch cheese. We give this account, believing that it will prove useful to our dairymen, and that it is desirable it should be placed in our Transactions for convenient reference hereafter. Much is to be learned from the best systems

of dairying, which prevail in other countries, and our dairy-men know how to avail themselves of any system which promises to be of advantage, and which may enable them to secure additional returns from their dairies. J.

CHEESE MAKING.

BY T. ROWLANDSON, C. E., F. G. S.

Historical Notice.—Cheese, and the curdling of milk, are mentioned in the Book of Job. David was sent by his father, Jesse, to carry ten cheeses to the camp, and to look how his brethren fared. "Cheese of kine" formed part of the supplies of David's army at Mahanaim during the rebellion of Absalom. Homer states that cheese formed part of the ample stores found by Ulysses in the cave of the cyclop Polyphemus. Euripides, Theocritus, and other early poets, mention cheese. Ludolphus says that excellent cheese and butter were made by the ancient Ethiopians; and Strabo states that some of the ancient Britons were so ignorant that, though they had abundance of milk, they did not understand the art of making cheese. There is no evidence that any of these ancient nations had discovered the use of rennet in making cheese; they appear to have merely allowed the milk to sour, and subsequently to have formed the cheese from the caseous part of the milk, after expelling the serum or whey. As David, when too young to carry arms, was able *to run* to the camp with ten cheeses, ten loaves, and an epah of parched corn, the cheese must have been very small.

Preliminary Remarks.—As butter is formed from the oily part of milk, cheese is composed of the curd or caseous portion. The perfection of cheese making consists in separating the curd and butter in one mass from the water and sugar; these last ought to be wholly taken out in the whey. In well made cheese, such as the North Wilts, Cheddar, and some double Gloucester, this is effectually performed, as may easily be tested by toasting; whereas, in many Cheshire, and particularly rich American cheese, the casein and butter are found to part when toasted. Age also causes this separation. The strong flavor of Cheshire cheese is attributable to the whey not being so well expressed as in the North Wiltshire, Gloucester, Cheddar, &c. Using too strong rennet, or putting the latter to the milk whilst too hot, produces the same effect. It is acknowledged by all who are acquainted with the subject, that the quality of cheese is not wholly dependent on

the richness of the soil nor the fineness of the herbage, for cheese of the first quality is sometimes made from inferior land, and by no means unfrequently from coarse herbage; neither does it depend on the breed of cows; difference of attention to the milk in converting it into cheese, and subsequent treatment, also having regard to the quality and quantity of food given to the cows, are the main sources of diversified flavors.

It is injurious to the quality of cheese to allow cows to feed on rotting grass and ill-flavored hay, or permitting them to run and heat themselves, driving them far to be milked, and allowing it to stand long after being milked before it is set with rennet.

Everything in cheese making depends on the dairymaid, and should in all possible cases be executed or superintended by one of the family—the farmer's wife or daughter. The management of the dairy should be conducted with the greatest regularity, every operation being performed at the proper time; hastening or delaying *any* matter may cause an inferior cheese to be made from milk of which, with proper attention, one of the best might have been made. The mode of making cheese in different districts, though in the main points apparently the same, is subject in practice to a greater variety of minor details than anything formed of one material; thus many different qualities are brought to market, each bearing some distinctive character.

Composition of Milk and Cheese.—Milk consists principally of casein (or cheesy matter), butter and sugar. The following is the composition of fresh milk, obtained from three domestic animals:

	Cow.	Ewe.	Mare.
Casein,	44.8	45.0	16.2
Butter,	31.3	42.0	trace.
Sugar of milk,	47.7	50.0	87.5
Salts,	6.0	6.8	896.3
Water,	870.2	856.2	
	1000.0	1000.0	1000.0

Skimmed milk, according to Berzelius, consists of

Water,	928.75
Curd not free from butter,	28.00
Sugar of milk,	35.00
Lactic acid and lactate of potash,	6.00
Phosphate of potash,	0.25
Phosphate of lime and magnesia, with a trace of iron,	0.30
	1000.00

COMPOSITION OF FOUR DIFFERENT KINDS OF CHEESE

	Skim milk.	Dunlop.	Cheddar.	Ewe milk.
Water,	43.82	38.46	36.04	40.13
Casein,	45.04	25.87	28.98	33.48
Butter,	5.98	31.86	30.40	19.80
Ash or saline matter,	5.16	3.81	4.58	6.59
	100.00	100.00	100.00	100.00

The quantity of casein in milk appears to be intimately connected with the nature of the food given to the animal, and as it, or the butryaceous portions preponderate, will the resulting cheese be found rich or poor; it is not, therefore, surprising to find good toasting cheese produced from comparatively poor pasturage, as well as from rich herbage; as examples, may be adduced the Derbyshire and North Staffordshire cheese.

It has been remarked in Cheshire, and, I believe, in other extensive cheese districts, that it is impossible to make cheese of the first quality of milk obtained from cows fed upon tares and clover; notwithstanding which, I had pointed out to me a farm on which the whole of the cows were fed almost exclusively during the summer on tares and clover, the entire produce of which dairy was converted into cheese, and that of a quality so excellent, that it always obtained the highest price from the London dealers at the Chester cheese fairs. The circumstance was mentioned to me as an illustration of what could be accomplished by management, the dairy-woman being esteemed one of the best hands in that celebrated cheese-making county. My own convictions are, that mere manipulation had little to do with it. The best cheese is a compound of cheese and butter. When the cattle were fed *at large* on leguminous food, rich in casein, that substance greatly preponderated in the milk, the butter being partly consumed by the animal in the course of the exercise requisite to procure its food, &c.; when fed *in the house* with the like food, the butter was necessarily yielded in a greater proportion, and consequently formed a rich fat cheese.

Rennet is the substance with which the cheese-maker "breaks" the milk. It is formed from calves' stomachs, technically termed "vills;" those obtained from Ireland are preferred. The reason for this preference is not generally known, and may therefore be here stated. The greater part of the calves in Ireland are killed before they are three days old; the stomachs of these "slink calves" are said to be much more powerful in breaking the milk than if older. Vills of more mature growth are however used.

Coloring.—Cheese is colored by using a substance called annatto; the kind called roll annatto is that which ought to be employed; the quantity is regulated by the richness of the milk, and the height of the color desired. If much cream has been taken from the milk, a proportionate additional amount of annatto will be required to obtain the required color. In Cheshire, one pound of good annatto is deemed sufficient for a ton of cheese; in Gloucester double that quantity is used. It would be well if public taste would so far change as to prefer uncolored cheese, as the Cheddar, Stilton, &c. When coloring is used, a piece of annatto of the required size is folded in linen, and placed over night in a half or quarter of a pint of warm water, to dissolve; this infusion is poured into the milk; the linen bag is also dipped in, and squeezed until the coloring is discharged.

Annatto is the produce of the Bixa Orilana of Linnæus. It is manufactured in two forms, one in flags or cakes of two to three pounds each, of a bright yellow color, soft to the touch, of good consistence, and comes from Cayenne wrapped in banana leaves, and is much used in giving a fugitive orange tint to silk and cotton goods; the other kind is called roll annatto, which is small, not exceeding two or three ounces each, hard, dry and compact, of a brownish color outside, and red within, is brought from Brazil, and is the kind which is, or rather ought to be, used in dairies.

Cheshire Cheese.—The county of Chester has been famous for a long period for its excellent cheese. It is stated that the Countess Constance of Chester (reign of Henry II., A. D. 1100), though the wife of Hugh Lapus, the king's first cousin, kept a herd of kine, *and made good cheese*, three of which she presented to the Archbishop of Canterbury. Giralders Cambriensis bears honorable testimony to the excellence of the Cheshire cheese of his day.

Mode of Manufacture.—The coloring and rennet having been put in the milk, it is well stirred and left to coagulate. The tub is now covered up, either with a wooden lid, or with cloths supported by the cheese ladder; this preserves the heat of the milk, and protects it from dust and dirt. The coagulation or "coming" is generally effected in an hour or an hour and a half. The "breaking" and "gathering" of the curd is the next process; this is now generally done by the curd-breaker, made of wire-work of an oval form, and has a tin rim round it about an inch and a half broad. The wire-work cuts the curd, by being passed through it perpendicularly in different directions, extremely gently at first, to separate the mass into very small portions. The length of time

required depends upon the quantity of curd; for a sixty pounds cheese it occupies from twenty to twenty-five minutes; after this the curd is left for a quarter of an hour to separate from the whey; if the weather is cold, the tub is covered to retain the heat; the curd being separated, and a portion of the whey taken out, it is gently broken by the dairymaid and her assistant, by passing their hands to the bottom of the tub, buoying up each time a portion of the curd, and using the curd-breaker. This operation occupies half an hour. At the expiration of another half hour (or as soon as the curd is sufficiently settled), it is drawn as much into one-half of the tub as its loose texture will admit. A semi-circular board, adapted to the size of the tub, is now placed in the curd, to which a weight of about thirty pounds is added. This board is perforated with holes, about half an inch in diameter, to allow the whey to escape. The tub is then set a few inches "a-tilt," to drain the whey more readily. The whey is passed through a sieve to collect any curd which may remain in it. The weight and board are shortly taken off, and such part of the curd that has been squeezed under them is collected at one side, and a heavier weight of fifty or sixty pounds applied. In the course of a quarter of an hour, the board is again removed, and the curd cut across at six or eight inches apart, to assist the discharge of the whey, and heavier weights (112 pounds) added; these weights are sometimes increased, always observing that the pressure is gradual and regulated by the compactness of the curd, otherwise a portion of the butter will be squeezed out. The curd is again cut into square pieces, taken out of the cheese-tub, and broken a little by the hands as it is passed into the "thrusting-tub," when the extraction of the whey is continued by the application of the screw or lever press. To assist still further the discharge of the whey, long iron skewers are introduced through the perforations in the tub, with their points directed upwards, so that when the skewers are withdrawn there remains an opening for the whey to drain. The curd is now cut through by intersections of two or three inches apart, drawn by a large dull knife, so as not to injure the cheese-cloth, and the edge or corner of the curd is cut off all round and placed in the center. After this the pressure is again applied and skewered as before; at the lapse of fifteen or twenty minutes, the curd is taken out of the tub, cut into four or five pieces, each piece broken separately by the hands into pieces two or three inches square. These operations are repeated until the whey is sufficiently extracted to admit of salting. Previous to

salting, the curd is cut into three or four equal sized pieces, each of which is broken into smaller pieces by hand, or passed once through the curd-mill; the salt is then scattered over it, and the "breaking" continued, either by the hands, the curd-mill, or both, until the salt is well intermixed, and the curd perfectly crumbled; as broken it is placed in the cheese-vat and comparted as much as possible by the hands, to be properly pressed; the vat should be overfilled and rounded up a little in the middle. The vat is again placed in the press and skewered. In the course of an hour it is taken from the press and turned, after which the pressing is continued for half an hour or an hour; it is now fit for removal to the stone or most powerful press, in which it is occasionally skewered and turned for about three days, after which a pressure is imposed equal to 30 cwt. to 40 cwt. On the fourth or fifth day it is usually removed to the salting and drying room; here salt can only be applied externally; after some time it is removed to the drying room.

Cheshire retains its celebrity for cheese making; the pride of its inhabitants in the superiority of its cheese, may be gathered from the following provincial song relative to the subject:

A Cheshire-man sailed into Spain,
To trade for merchandise:
When he arrived from the main,
A Spaniard him espies,

Who said, "You English rogue, look here—
What fruits and spices fine
Our land produces twice a year!
Thou hast not such in thine."

The Cheshire-man ran to his hold,
And fetched a Cheshire cheese,
And said, "Look here, you dog! behold,
We have such fruits as these!

"Your fruits are ripe but twice a year,
As you yourself do say;
But such as I present you here,
Our land brings twice a day."

The Spaniard in a passion flew,
And his rapier took in hand;
The Cheshire-man kicked up his heels,
Saying, "Thour't at my command!"

So never let a Spaniard boast,
While Cheshire-men abound,
Lest they should teach him, to his cost,
To dance a Cheshire round!

The above song, with the music prefixed, was published about the year 1746, during the celebrated Spanish war, in the reign of George II.

Gloucester Cheese Making.—The processes adopted in the manufacture of every variety of cheese are necessarily much alike; yet upon very minute differences of details, important results follow. The following résumé of the Gloucester mode will, no doubt, prove interesting. The cheese-tub being put in its place in the dairy, the ladder is placed across it; and a large, thin canvas cloth is thrown over the tub and ladder, so as to cover both, in order to catch any milk which may drop from the pail, and to prevent dirt falling into the tub. Above this, and upon the ladder, is placed the sieve through which the milk is strained. If the milk should not be of a temperature of 85 degrees, a portion of it is placed in a deep tin kept for the purpose, and placed in a boiler used as a hot water bath, by which means the whole is warmed to a proper degree. It is considered of the utmost moment to attend to this; for if the milk is not warm enough when the rennet is put into it, the cheese will be "tender," and bulge out at the edges, which spoils its appearance; and a great quantity of sediment of small curd will subsequently be found in the whey-leads, being so much curd lost. If, on the other hand, the milk is too warm, it will cause the cheese to "heave," or ferment, which is injurious both to its quality and appearance. When the milk is sufficiently warm, the coloring and the rennet are put into it. One pound of annatto is considered sufficient for half a ton of cheese. The rennet is added immediately after the admixture of the coloring ingredient. The tub is then covered with a woollen cloth for at least an hour. When the curd is sufficiently firm for breaking, it is gently and slowly cut across at right angles with a three-bladed knife, about fourteen inches long, close to the bottom of the tub, and around its sides. The cuts should be about an inch apart. When it has stood five or ten minutes, to allow it to sink a little, that the whey may come out as clear as possible, some of the whey is taken out with a bowl, and the curd is cut a second time—very slowly, to begin with. If the cutting is done hurriedly, a considerable sediment of very small curd will pass through the sieve, and be found in the whey-leads; at the same time a quantity of butter will escape, thus impoverishing the cheese. As the operation proceeds, the cuttings are made more rapidly, and at a less distance. Lastly, one hand, with the skimming dish, keeps the whole in motion, turning up the lumps suspended in the whey, while the other, with the knife, continues cutting them as small as possible. This continues until no more lumps are brought to the surface, the whole mass being reduced to

one degree of firmness. This occupies about a quarter of an hour. The curd being now allowed to "stand" for a quarter of an hour, to settle, and the whey being in a great measure taken out, the dairymaid commences folding over a portion of the curd, beginning at one corner, also cutting the curd into lumps, and laying them on the principal mass; by which means the major portion of the remaining whey exudes from between the cut portions. From time to time, as it accumulates, the whey is taken from the tub. The curd is now placed in vats, and pressed with the hand, these vats being, in the first place, covered with fine canvass, are placed in the press for half an hour, at the expiration of which period they are taken out, and the curd cut into slices, and put into a mill fixed on the top of a tub, which tears it into particles as small as vetches. Some scald the curd in this pulverized state with hot whey; others at once place it in the vats, pressing it closely with the hand in filling, in order to squeeze out any remaining whey, the vat being filled with curd, and rounded up in the middle, as far as the whole can be pressed into the vats. Cheese cloths are then spread over the whole, and a little hot water sprinkled over the top. This operation has a tendency to harden the outside of the cheese, and prevents it from cracking.

The curd is now turned out of the vats into the cloths, and the vats are dipped into the whey to wash out any crumbs of curd which may cling to them; the curd, with the cloth around it, being inverted, is again placed in the vat. The cloths are then folded over, and tucked in, and the vats, as they are filled, are put into the press one upon another. The bottoms of the vats are smooth, and a little rounded, so as to answer the purpose of churn-boards, which are only wanted for the uppermost vats, or when the other vats are not quite full. The vats are allowed to remain under the press about two hours, when they are taken out, and dry cloths are applied, which with double Gloucester cheese should be repeated some time during the day. In this state they are removed to the salting press; they are generally salted at the end of twenty-four hours. The salting should not commence until the skin is all closed, for if there is a crack in the skin of the cheese at the time of salting, it will not close afterwards. The salting is performed by rubbing both sides and the edge of the cheese with finely powdered salt; after which they are returned to the vats and put under the press, the newest cheese being placed lowermost and the oldest uppermost. The salting is repeated three times with the single, and four times with the double Glou-

cester, twenty-four hours elapsing between each salting. After the second salting, the cheese are returned to the vats without cloths, so that the marks of the cloths may be effaced. Double Gloucester remains in the press five days, and the single four, but in damp weather they should remain longer. The quantity of salt used is about three pounds and a half to one hundred weight of cheese. When taken from the salting process, they are placed on a shelf in the dairy for a day or two, prior to removal to the cheese-room. In the cheese-room they are turned once a day, on the floor, or on the cheese-rack. In about a month they are ready for cleaning, which is done by scraping both sides and edges; after which it is covered with red paint, made of Venetian red and small beer. It is rubbed on with a woolen cloth; they are subsequently turned twice a week, and oftener in damp weather, until fit for market.

New Cheese, in some places called "slip-coat," is only made in the early part of summer, when the cows are turned out to grass, and is formed entirely of new milk, with a portion of warm water added before the rennet is put to it. The whey is then gently poured off, and the curd is carefully kept entire until put into a chopart of considerable diameter, but only one or two inches in depth; it is very gently pressed with a weight of two or three pounds for a few hours only, and when removed from the vat is covered with a cloth which is frequently changed. As soon as the skin is formed, it is considered fit for use. This kind of cheese is known in the London market as "Cottenham cheese."

Skim-milk Cheese is made of milk from which the whole of the cream has been taken. It is more or less palatable according to the time the milk has been allowed to stand; for if deprived of the whole of the butter, the cheese becomes exceedingly hard in a short time; when consumed before it becomes very hard, it forms a wholesome food for working men.

Cream Cheese ought to be made from the entire cream, but this is seldom the case, the greater part of the cream cheese usually sold being made in the same manner as the new cheese already described, and often of the overnight's milk with the cream taken off. The finest cream cheese we ever met with was made in the East Riding of Yorkshire.

Parmasan Cheese.—The country between Cremona and Lodi comprises the richest part of the Milanese. Irrigation is here brought to the highest state of perfection. The grass is cut four times a year as fodder for the cows, whose milk is converted into

the well-known Parmasan cheese. The cows are kept in the stall nearly all the year round, and are fed during the summer on two of these crops of grass or clover, which are cut green, and in the winter on the hay made from the other two cuttings. The milk of at least fifty cows is required for the manufacture of a Parmasan cheese. As one farm rarely affords pasture for such a number, it is usual for the farmers or metayers of a district to club together. The milk of fifty, sixty or even one hundred cows is brought to the farm where the dairy is fixed; the person on whom devolves the task of making the cheese keeps an account of the milk received, and the produce of the cheese is afterwards proportioned accordingly. In this fertile plain, a farm of sixty acres is considered a large one. These farms are divided into fields of three or four acres, for the convenience of irrigation, a practice which in the course of a few years impairs the quality of the grass to such a degree that it becomes necessary to discontinue it. The ground is plowed in autumn, and in the following spring is sown with hemp which grows luxuriantly. After the hemp is pulled, leguminous plants are sown, which is followed by oats, wheat, maize, wheat. The richness of the soil being now sufficiently subdued, the ground is left to itself, and is immediately covered with herbage, and is again continued in grass for about fifteen years.

Neufchatel and Gruyere Cheese are manufactured in a similar joint-stock manner to the above.

Gouda, Eidam and Frieseland are Dutch cheese manufactured in the same way that English cheese is made.

MRS. THERON VAN AUKEN—Phelps, Ontario County.

CHEESE STATEMENT.

This cheese was made from the milk of six cows. The milk was strained into a tub, and then added the rennet. We run up the milk night and morning, and break the curd in one half hour, or according to its coming. We prepare the rennet in the following manner: soak one rennet in fresh water twenty-four hours, make one gallon of brine, boil and skim when cool, add the rennet and the water in which it was soaked. We remove the curd into a strainer, let it drain, cut it frequently, and when free from whey, we scald in water at 110 degrees, until the curd will squeak when pressed in the hand. Vary the degree of scalding according to the temperature of the atmosphere; remove the curd from the water when drained and cool; add half a teacup of salt to fourteen pounds of curd; we use the common barrel salt pressed in a self-

presser, let the cheese press two days. We use no coloring matter; the bandage we put on when the cheese is taken from the press. We oil and turn them once a day. When cheese have not sufficient salt, they will swell. We use the thermometer to test the degree of heat. MRS. THERON VAN AUKEN.

CLIFT EAMES—RUTLAND, JEFFERSON COUNTY.

CHEESE STATEMENT.

I warm water and pour it in a vat around the milk vat, sufficiently to warm the milk to about ninety to ninety-five degrees, when I put in the rennet. I add the rennet to a higher degree of heat in cold weather. I use calves' rennet, and prepare it with salt and water in a stone jar. I break the curd with a tin cheese-cutter. I break the curd when it is of sufficient toughness. I commence scalding when I have broken the curd to sufficient fineness. I scald with hot water in a wooden vat that surrounds the tin vat, and heat to scald from 100 to 105. I use the best of the common salt, and use one teacupful to twenty pounds, and apply it when the curd is quite dry. I am very careful not to put in the press until the curd is perfectly cool, which will prevent the cloth sticking. I use the lever and pulley press. I use coloring on the outside. The rind is formed by making the cheese as it should be. I use the common whey oil. There are various causes for cheese raising; one is from its being sour, and another is by useing too much rennet. I use the thermometer often, but not all the while. CLIFT EAMES.

MOSES KENNEY—CORTLAND.

CHEESE STATEMENT.

I keep a dairy of sixty cows, at Truxton. We do not warm all the milk, a part of it only; and that to attain the animal heat at or near the degree of the milk as it comes from the cow. We vary the milk at different seasons, useing most warmed in cold weather. The calves' rennet is used, prepared by placing in a jar, four rennets to four gallons of whey, useing more salt than will dissolve. We commence breaking the curd as soon as it can be drawn without adhering to the finger. The curd is broken by a Herkimer county four bladed cast steel knife; the blades are half an inch apart, two feet long. The curd, when the whey is out, is com-

pact, and then it is scalded. It is scalded by heated whey, heated to boiling, and then poured into the curd, and the curd at the same time stirred; and the whey is kept in the curd until thoroughly cooked.

We scald most in hot weather. I separate by a strainer; my rule is to apply the salt when perfectly broken. I use the Onondaga dairy salt, using one pound to forty pounds curd. Immediately on the curd being cooled, the salt is applied. I use the self-presser, one which regulates the weight, so that the power can be applied according to the weight of the cheese, for twelve hours, and then a turning twelve hours more, twenty-four in all.

The cloth adheres because the curd is put in the hoop too warm. Our cheese is *not artificially colored*, it has its color only from the cream left in the cheese. The rind is made by hot oil rubbed on to the cheese when first taken to the press. Our oil is our own butter and lard mingled together. Cheese swells by the want of thorough scalding and salt. I do not use the thermometer.

PINE APPLE CHEESE.

PROCESS PURSUED BY PELEG PENDLETON IN ITS MANUFACTURE.

Rennet is used sufficient to curdle the milk in forty minutes, according to the quantity of milk; it is then cut in squares with knives made for that purpose; it is then broken carefully with the hands, then left to settle; the whey is then drained off with a tin strainer; it is then scalded by three applications of hot whey, raised to a temperature of from 100 to 120 degrees, shrinking it more than for common cheese, then made fine by cutting with the knives. One teacup of Ashton salt, to sixteen pounds of curd; then put in molds and pressed in a lever press for about twenty hours, after which it is taken out and put in nets, scalded and hung up for six weeks to cure. PELEG PENDLETON.

Norwich, Chenango Co., N. Y.

WM. W. PUGH—Turin, Lewis Co.

First Premium.

DAIRY BUTTER.

Wm. W. Pugh's statement for making butter, and answers to questions put in premium list, page 19.

1. I manufactured ——— tubs of butter between 15th May and first of Dec., 1858, from twenty-two cows, of which the sample of three tubs was made in September, October and November.

2. I wash my pails and pans thoroughly clean, and scald and dry.

Strain my milk into tin pans about three inches deep; set on a rack where it will have plenty of air without a current of air, as the cream will become too hard; cream to be skimmed as soon as sour enough to separate from the milk. Stir the cream after each skimming to prevent the sour milk curdling at the bottom. Cream kept in tin pails, open to the air, in warm weather, keep it on ice, over night previous to churning. Scald the churn, and then put in ice water; when the butter begins to curdle add a little ice to make it hard.

3. When the butter is well gathered, take it out with the ladle and drain all the buttermilk off, then put it into a bowl of ice water, then press the buttermilk all out and pour all off, then add about an ounce of Ashton salt to one pound of butter, and in case we over salt, we, after twenty-four hours laying in a cool place, re-work it thoroughly.

4. Boiled salt is injurious to butter on account of the lime used. We use no saltpeter or anything to make salted butter better. We pack our butter in well made ash tubs that will not leak out the brine, that being very injurious to butter in warm weather. After packing, we cover the butter with a wet cloth, and an inch of salt all over the butter, shut down the cover, place the tubs away in a good dry cellar until cold weather, and then take them out of the cellar and place them in a cool upper room. Our cows are a cross between the Durhams, Devons and natives, which kind we prefer to any clear blood.

There is a very material difference in quantity and quality of milk; some cows will give a large quantity of milk, looking blue, which furnishes no cream of worth; they should be turned off for the butcher. Other cows that give small quantities of milk, will furnish as much butter from their cream as others giving a third more. WM. W. PUGH.

Turin, *Feb.*1, 1859.

HIRAM MILLS—Lowville.

Second Premium.

To the committee appointed by the New York State Agricultural Society, to examine samples of butter, at winter meeting, Feb. 9th 1859:

I submit the following statement of the method of making three tubs of butter herewith exhibited, and on which I apply for the premium offered by the New York State Agricultural Society, for the best sample of butter made in the fall of 1858.

1. Number of cows kept was thirty-two, four of which were three years old, and four two years old.

Made cheese from the 10th May, to the 6th October. Commenced setting milk for the sample offered, 7th Oct; made in seven days the four tubs offered, one of which was made by my daughter, Jane E. Mills. Have made, the present season, 9,500 lbs. cheese, and 1,450 lbs. butter, besides family use.

2. Milk set in tin pans on rack or slat shelves (temperature of room 70°), and allowed to stand until it is sour, and sometimes until it thickens, but never should be allowed to stand until it turns spotted, as that injures the flavor of the butter. Cream taken from the milk and kept in tin cream pail until enough is obtained for a churning; use crank churn propelled by hand; churn from forty to fifty pounds at a time. After the butter has come, draw off the buttermilk and wash with cold water in the churn, unless the butter comes very hard, when the washing is omitted. Butter taken from the churn and worked thoroughly by hand until it is freed from the milk, then apply one ounce Ashton salt to one pound of butter, which should be well worked in, to prevent the butter from being streaked; it is then allowed to stand twenty-four hours, after which it is worked with a butter worker, being careful not to injure the grain. No other substance is used to preserve the butter. Have generally used this kind of salt in making butter; usually pack in eighty pound tubs, and as soon as one is filled cover with a thin cloth and then a quantity of salt to exclude the air. Tubs are prepared by soaking in brine.

All of which is respectfully submitted.

HIRAM MILLS.

L. L. FRENCH—Warren, Herkimer Co.

METHOD MAKING BUTTER.

The butter was made from three cows; two native, and one two year old Durham heifer. The butter was made between the months of June and November; feed common pasture with green corn fodder once a day, from first September. Milk set in tin pans; churned once in eight or ten days, in common dash churn, and made after the following receipt, which I copied from a book published in Boston, over half a century ago, called The Medical and Agricultural Register:

Take two parts of salt; one part of loaf sugar; one of salt-

peter; beat them up together, and blend the whole completely; take one ounce of this composition for every sixteen ounces of butter; work it well into the mass, and close it up for use.

L. L. FRENCH.

B. S. CARPENTER—Chemung Co.

THREE TUBS, MADE JUNE, AUGUST, AND NOVEMBER.

First Premium.

To the Committee on Butter:

Gentlemen—The samples of butter I submit for your inspection, are entered for the premium offered for samples made in June, August, and November. The June firkin was made about the middle of June; the August firkin during the third week of August; and the November firkin during the second week of November; all from thirty-three cows.

The manner of making and preserving the butter was the same as set forth in my statement, published in the Transactions of 1856, page 268, to which reference is made.

B. S. CARPENTER.

Feb. 10*th* 1859.

JANE E. MILLS, 14 Years of Age.

Special Premium.

Lowville, Lewis Co., N. Y.

Butter made by Jane E. Mills, (fourteen years of age,) October, 1858; entered for a premium at the annual meeting, held at Albany, February, 1859.

Milk was drawn regularly from the cows morning and evening, and strained in tin pans, and set on racks in a moderately warm room, and allowed to sour. The cream was then taken off and put in a tin cooler until enough was collected to churn; churned in a crank churn. The butter was washed with cold water, when not sufficiently hard; taken from the churn by hand and thoroughly worked and salted with Ashton's salt; one ounce to a pound of butter; let it stand twenty-four hours, and then worked it with a butter worker. Packed in a tub, and set in a cool room. No other substance used to preserve the butter.

JANE E. MILLS.

MRS. ELA MERRIAM—Leyden, Lewis Co.

WINTER BUTTER.

First Premium.

Statement for making Winter Butter.—My milk is set in tin pans, in a room where the thermometer ranges from 60° to 75°, (I prefer to have it 75°,) standing in the pans, about forty hours before skimming; then take the cream off and place it in a stone jar, keeping it in a warm room; stir it thoroughly every time I skim my milk; and when ready for churning I scald my churn, and put my cream into the churn while warm, stirring the cream continually to prevent its becoming oily; then churn until the butter begins to curdle, then put a little snow or cold water into the churn, and when well gathered take it out into a bowl of cold water, press out the buttermilk, and pour it off; then add three fourths of an ounce of Ashton or evaporated salt, to a pound of butter; it requires less salt for winter than in the summer for making good butter. Our Salina boiled salt is not good for butter, as the lime used in manufacturing is very injurious to butter. The two pots I now exhibit were made, No. 1, on the 15th day of January; the other, No. 2, made on the 1st day of February, inst. The butter was made from milk from four new milch Devon cows, all suckling calves. The cows are fed on good hay with a few white carrots, and slopped every day with buckwheat bran or shorts. The cows stand in a warm stone stable, from three to four P. M., until next day about ten o'clock, A. M.; then turned out into the yard, where they find a large trough of running water which comes out of a slate bank.

A plenty of good hay, warm stables, and pure water in abundance in a large trough in the yard, for cattle to go to a half a dozen times in as many hours, will keep cows in high order in a country cold enough to make good butter.

We think the great secret of making yellow butter in the winter is in taking the milk from new milch cows, and setting it in a warm place, not allowing either the milk or cream to get chilled.

Very respectfully, yours,

MRS. E. MERRIAM.

Leyden, *February 1st*, 1859.

SOLOMON WALRATH'S STATEMENT IN RELATION TO THE WINTER MADE BUTTER PRESENTED BY HIM FOR PREMIUM.

I feed my cows twice each day with corn stalks and carrots, and once a day on cabbage.

I fill the pans two-thirds full, place them on a milk rack. Du-

ring cold weather, the room in which I keep the milk, I keep warm with a stove at a temperature of about 60°. Skim the milk before any chemical process appears on the cream; the precise time must be determined by the eye of the experienced butter maker. Allow no current of air to strike the milk; the temperature of the cream should be full 60°. Cream is placed in an air-tight vessel, and should not be exposed to the air after having been taken from the milk, and should be thoroughly stirred once each day, say at every skimming of the milk. During churning, air should occasionally be allowed to come in contact with the cream and a uniform temperature be preserved. Butter should never be worked with the hands, but ladle, and gashed so as to allow the buttermilk to escape. In salting butter, I use the pulverized Turk's Island salt, and just enough to give it an agreeable flavor, not to preserve it, for preservation of butter depends entirely upon its being free from milk and a proper and suitable care of the cream. I am also very careful to have my stables cleanly, and the bodies of the cows clean and wholesome. I would here remark, that after my butter is packed, I place a cloth over it, which I cover with salt and make a brine which I apply once each week, which preserves the flavor of the butter on the top.

LEVI HANFORD AND HIRAM OLMSTEAD—Walton, Delaware County.

Statement of a dairy kept by Levi Hanford and Hiram Olmstead, in Walton, Delaware county, New York, during the year 1858:

The number of cows milked has been thirteen, from four to fourteen years old, and three, two years old heifers. The whole number would be fifteen, after deducting one-third for the heifers. Eleven of the cows are natives, four grade Devons and one grade Durham. They began to come in the last of March, and one or two did not come in until in June. The cows have been fed no grain, but in addition to hay, (mostly timothy), each has been fed six or eight quarts of ruta bagas per day, during that part of the winter that they were milked. They usually go dry not less than two, or more than three months. The roots were fed *after milking* and the cows salted often. Each cow is milked usually by the same hand as quick as it can be conveniently done. The milk is strained in eight quart pans, filled half full in summer. The milk room is made as cool as can be, in warm weather, and

has a free circulation of air. We think it quite important to skim the milk at the proper time, that is when it begins to thicken on the bottom of the pan. The cream is strained through a wire sieve to prevent white specks in the butter, and then churned in the common dash churn, at a temperature varying from 60° in warm, to 66° in cold weather, Fahrenheit.

The machine used is the common tread wheel, propelled by sheep power. As soon as the butter has come and gathered, it is taken out and the buttermilk is separated by washing and pressing the butter by hand with ladle, and salted at the rate of one oz., or nearly, of Ashton salt, to a pound of butter. The following day it is again worked and packed in hundred weight firkins. When a package is full a cloth is spread over the butter, and then a laying of salt. This is kept moist. The whole is then covered with a thin flat stone, set in a cool cellar, and remains so until it is sent to market.

The spring and fall butter has been packed in tubs or firkins and sent to New York by express and sold as fast as it was made. The early and late made, brought from twenty to twenty-six cents per pound, this year. The dairy was sold for twenty-four cents, we paying the freight to New York.

The contract was made in August, too early in the season to secure the best price, this year.

The average number of pounds made from each of the 15 cows, 196⅓ lbs. Net average income from all sources, from each, $52.00.

Butter sold.

2561 lbs. brought in New York,		$613 43
Less freight, cartage and commission,	$27 27	
Less tubs, firkins, $23.50, and salt $2.00,	25 50	
		52 77
Net income from butter sold,		$560 66
*Consumed by family before May 5, 100 lbs. at 22 cts.		22 00
Consumed after May 5, 284 lbs., at 22 cts.,		61 48
*The family of nine persons has been supplied with cream and milk nine months,		19 00
Value of pork made from milk, after deducting for other feed,		100 00
Value of milk fed to calves,		10 00
14 deacon skins, at 4s,		7 00
Net total income,		$780 14

*Estimated very low.

LEVI HANFORD,
HIRAM OLMSTEAD.

Delaware county, ss:

Levi Hanford & Hiram Olmstead being duly sworn, do certify that the foregoing statement is true and correct.

Sworn and subscribed, this, the 31st day of Dec., 1858, before me,

S. H. WHITE, *Justice of the Peace.*

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

As the subject of grasses is attracting much attention in this country, everything calculated to shed light upon the proper management of the grass crop, is of interest to our farmers and dairymen. In the 19th volume of the Journal of the Royal Agricultural Society of England, p. 552, is a very excellent report of experiments made with different manures on permanent meadow land, by Professors Lawes and Gilbert, of Rothamsted, England. These gentlemen are not unknown to our readers; their valuable experiments on the growth of barley by different manures, published in our Transactions for 1857, p. 347, gives sufficient evidence of their capacity to do full justice to any experiments which they undertake. There are no men of the present day, who are doing more practically to benefit the cause of agriculture, than Messrs. Lawes and Gilbert. The experiments which have been made as to the manures adapted to permanent meadows, will add to their already well earned reputation; and we take great pleasure in giving to our farmers, at as early a day as practicable, the results of their investigations. J.

REPORT OF EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

BY J. B. LAWES, F. R. S., F. C. S., AND DR. J. H. GILBERT, F. C. S.

PART I.—*Produce of hay per acre.*

The extent of land in this country in permanent grass, and the importance of the crop, both as regards its yield of food for animals, and its relations, under existing circumstances, to the crops under tillage, establish for it a high claim to investigation, with a view to increased productiveness. In several of its aspects, and in some involving its most intricate relations, the subject has received the attention of investigators at once competent and laborious. The pages of the 'Journal of the Royal Agricultural Society of England, sufficiently bear out this statement. Among them are to be found valuable records of practical observation and experience, as to the distribution, the adaptation, and the comparative utility of the most important plants composing this hetero-

geneous crop, according to character of soil, climate, and other circumstances.* We have elaborate examinations by Professor Way, into the composition of the several plants, each grown under circumstances favorable to its development, and all taken as far as possible, at an equal stage of growth.† And in the last number of the Journal, will be found three papers, each of great but distinctive value, bearing upon the practical management and manuring of the grass crop. As the title of the present paper will indicate, its scope and object are sufficiently distinct from those of the inquiries above alluded to. And, whilst the plan of the investigation which has been undertaken, and the character of the data which it has afforded, will necessarily lead to a somewhat special treatment of the subject, we shall endeavor, as far as circumstances will permit, to pay due regard to what appears to have been established hitherto.

An inquiry into the comparative effects of different manuring substances upon permanent grass, has, however, other grounds of interest than such as relate merely to determining the best means of increasing the gross amount of its produce. There is, perhaps, no crop more influenced in its *character*, as well as its *quantity*, by the attention bestowed upon it. Our grass crop comprises, as it is well known, not only a great number of genera and species belonging to the *graminaceous* family—the natural grasses commonly so called—but also various members of other families of plants, among which, by far the most important, is the *leguminous*. It so happens, then, that in our meadows and pastures, there are associated members of those two families of plants that afford us the crops which are not only the most important among those which enter into our rotations, but which, as there grown separately, and in alternation, exhibit very characteristically, different degrees of dependence upon the direct artificial supply of some of their constituents; and coincidently with this, show very distinctive relationships to one another in the course of cropping.

Thus wheat, barley and oats are of the graminaceous family, and have, therefore, so far, their points of close relationship with the so called "natural grasses." Beans, peas, and the cultivated clovers, lucerne, &c., of our rotations, are, on the other hand, of the *leguminous* family; and hence their relationship to the clovers,

*See "Prize Report," by Mr. John Bravender, Jour. Roy. Ag. Soc., vol. V; also papers by Professor Buckman, Jour. Roy. Ag. Soc., vol. XV., p. 462; vol. XVII., p. 162; and vol. XVII., p. 513.

†Jour. Roy. Ag. Soc., vol. XI., p. 530, and vol. XIV., p. 171, (and Trans. N. Y. S. Ag. Soc., 1856, p. 244.

and allied plants, of our meadows and pastures. It is true, that the circumstances of growth, and the treatment of the plants composing the mixed herbage of our pastures and meadows, are widely different from those of the allied plants—especially of the seeding ones—in our arable fields. In the one case, too, the plants are chiefly perennial, and in the other chiefly annual. It might well be expected, therefore, that notwithstanding their natural alliances, crops which differ so widely both in certain comparatively incidental conditions of growth, and in some intrinsic qualities, should, at the same time, manifest somewhat different manurial requirements.

Among the most interesting of the points incidentally brought out by the experiments which form the subject of the present report, is the striking conformation which the results afford of the (so to speak) special adaptation, in a course of practical agriculture, of certain constituents of manure, to the growth of certain of the crops of our rotations, accordingly as they belong to the one or the other of the two great families of plants above referred to. That is to say, the comparative action of different descriptions of manure, upon the development of the different plants of the mixed herbage of our meadow, was found to accord with, and further to illustrate points independently established, regarding the manurial requirements, and the mutual relations of the plants of our rotations, to which they are botanically allied. At the same time, independently of the difference in other conditions of growth and management, the permanent and alternating crops generally differ so widely, both in regard to the amount of certain constituents which they respectively remove from the land, and to the proportion of these which will probably be in due course returned in the home manures, that the character of the supplementary manures required by even much allied crops, must obviously be somewhat different in the two cases.

To turn to the experiments themselves: The plan adopted, was to apply a number of different combinations of manuring substances, each, year after year, to the same plot of land. And in order to provide proper standards of comparison, two plots were left continuously unmanured, and another portion was annually manured with farm-yard manure.

The land selected, comprised about six acres of the park at Rothamsted, and it had been under permanent grass for certainly more than a century; indeed, for as long a period as is included in any record that can be found relating to it. The general mode

of treatment for many years prior to 1851, was to manure occasionally with farm-yard dung, road scrapings, and the like; and sometimes with guano, or other purchased manure. One crop of hay was removed annually, amounting in weight, from one and a quarter to two tons per acre, and the second was always eaten off by sheep. In the spring of 1851, and again in that of 1852, four separate acres of the alloted area were appropriated to the consumption by sheep of as many lots of differently manured turnips; ten tons of the roots being eaten upon each acre. Neither the four acres so appropriated, nor the remaining two were manured in any other way in those two seasons; nor were they manured at all, in the three succeeding ones prior to the commencement of these experiments in 1856.

It should be mentioned, too, that the consumption on the land of the different turnips, did not in any case increase the produce over the five years, 1851–5 inclusive, by more than about two hundred weight per acre, annually. The land is a somewhat heavy loam, with a red clay subsoil resting upon chalk; and although not artificially, is very well, naturally, drained. The area selected was perfectly level. Lastly, no fresh seed of any kind has been sown either within the period of the experiments, or for many years before it.

Early in 1856, nine plots, of half an acre each, were measured off, for as many different combinations of so-called artificial manuring substances; two, of an acre each, to be continuously unmanured; and two, also, of a quarter of an acre each, to be manured annually with farm-yard dung. In 1858, four additional plots, of one-sixth of an acre each, were appropriated to trials with nitrate of soda; the land so selected having been unmanured for several preceding seasons. The description and quantities per acre, of the different manures employed, are given in the tables, by the side of the results they yielded; but it will be well to state them here, at one view, a little more fully than there is there room to do.

Plot 1.—Unmanured.

Plot 2.—Unmanured, (duplicate plot at the further end of the series.)

Plot 3.—2,000 lbs. sawdust.

Plot 4.—200 lbs. each sulphate and muriate ammonia, (good samples of the salts so named in commerce.)

Plot 5.—2,000 lbs. sawdust, and 200 lbs. each sulphate and muriate ammonia.

Plot 6.—275 lbs. nitrate of soda.*

* The experiments with nitrate of soda did not commence until the third season, 1858.

Plot 7.—550 lbs. nitrate of soda,* (equal in nitrogen to the ammoniacal salts of plot four.

Plot 8.—Mixed mineral manure composed of

200 lbs. bone ash,
150 lbs. sulphuric acid, (sp. gr. 1. 7. } superphosphate of lime.
300 lbs. sulphate of potash.†
200 lbs. sulphate of soda.†
100 lbs. sulphate of magnesia.†

Plot 9.—"Mixed mineral manure," as plot eight, and 2,000 lbs. sawdust.

Plot 10.—"Mixed mineral manure," as plot eight, and 200 lbs. each sulphate and muriate ammonia.

Plot 11.—"Mixed mineral manure," as plot eight, and 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. sawdust.

Plot 12.—"Mixed mineral manure," as plot eight, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. cut wheat-straw.

Plot 13.—"Mixed mineral manure," as plot eight, and 400 lbs. each sulphate and muriate ammonia.

Plot 14.—"Mixed mineral manure," as plot eight, and 275 lbs. nitrate of soda.*

Plot 15.—"Mixed mineral manure," as plot eight, and 550 lbs. nitrate of soda,* (equal in nitrogen to the ammoniacal salts of plots 4, 10, &c.)

Plot 16.—Fourteen tons farm-yard dung.

Plot 17.—Fourteen tons farm-yard dung, and 100 lbs. each sulphate and muriate ammonia.

It would have been desirable to have had some plots with the superphosphate of lime, and the mixed alkali-salts, used separately; but it was considered, that to increase the number of the experiments, would be to extend the series beyond convenient practicable limits.

The artificial manures were, for the purpose of equal distribution, mixed with ashes prepared by burning soil with a portion of weeds and turf. They were sown broadcast. The date of sowing was, in 1856, the middle of February; in 1857, the 24th of February; and in 1858, the 31st of March; excepting that the nitrate of soda (used in 1858 only) was not applied until the 8th of April.

The farm-yard manure and the sawdust, excepting in the first season, were put on in the previous November or December. The

*The experiments with nitrate of soda did not commence until the third season, 1858.
†The sulphate of potash and soda used, are the rough commercial articles; the sulphate of magnesia, epsom salts.

first crop only, in each year, was mown; and the produce of each plot was weighed separately as *hay*, at the time of being carted to the rick. The second crop was eaten off by sheep having no other food; each plot, according to the bulk of its produce, having a given number penned upon a portion of it, the area being extended, day by day, as the feed was eaten down. To the further particulars of the feeding, and to the estimates made of the produce of the second crop, we shall recur presently.

The weight of the hay (one cutting) taken from the different plot, in each of the three seasons, is given in Table I, p. 208.

Although the three seasons over which the experiments have extended, differed widely one from another in climatic characters. The amounts of *gross produce*, under equal conditions of manuring, were, upon the whole, much the same in the three seasons. There was indeed a tendency to increase, from year to year, as the experiments proceeded; but this tendency is the more apparent when the acreage amounts of *dry matter*, instead of the gross produce of hay merely, are considered. Viewed in this way, the increase was moreover much greater in the second year as compared with the first, than in the third as compared with the second. It was, too, perhaps upon the whole, the more marked where the most liberal manuring was employed, and the largest crops thereby obtained. On this point it should be remembered that the manure from the sheep consuming the second crop, so far as it was due to the residual manures applied for the preceding first crop, would be so much addition to that supplied for the first crop of the succeeding season; and that the addition would be the greater, the more liberal had been the manuring, and the larger the amount of after-grass. It would, too, with excess of manure, be somewhat cumulative, and relatively the more so, the more excessive the manuring, and the greater the produce of after grass.

The difference in the produce by the same manure, in one season compared with another,—at any rate the increase in amount of it in the second year of manuring over that in the first—cannot, therefore, be *wholly* attributed to differences in the characters of the seasons themselves.

With regard to the seasons themselves, a few general observations may nevertheless be made. The growing period of the first season, 1856, was generally much colder and wetter than that of either 1857 or 1858.

Experiments with different Manures on Permanent Meadow land.

TABLE 1.—*Produce of Hay per acre.*

Plot numbers.	MANURES. (Per acre, per annum.)	ANNUAL PRODUCE. 1856. Cut June 25; carted July 1. Tons.	Cwt.	Qrs.	Lbs.	1857. Cut June 23; carted June 26-27. Tons.	Cwt.	Qrs.	Lbs.	1858. Cut June 26; carted June 29-30. Tons.	Cwt.	Qrs.	Lbs.	Average of 3 years. Tons.	Cwt.	Qrs.	Lbs.	Average annual increase or loss by manure. Tons.	Cwt.	Qrs.	Lbs.
	SERIES 1.—Without direct mineral manures:																				
1	Unmanured,	1	2	1	23	1	5	2	0	1	2	0	8	1	3	1	10				
2	Unmanured (duplicate plot),	1	0	3	27	1	3	0	16	1	10	0	0	1	4	2	34				
	Mean or standard unmanured,	1	1	2	25	1	4	1	8	1	6	0	4	1	4	0	3				
3	2,000 lbs. sawdust,	1	0	2	16	1	0	3	16	1	0	0	4	1	0	2	3	0	3	2	0
4	200 lbs. each sulphate and muriate ammonia,	1	15	3	24	1	13	2	22	1	15	2	6	1	15	0	8	0	11	0	5
5	200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. sawdust,	1	15	1	5	1	13	0	14	1	17	0	22	1	15	0	14	0	11	0	11
6	275 lbs. nitrate of soda,*	.....				.....				1	6	1	12	.....				0	2	1	9
7	550 lbs. nitrate of soda,*	.....				.....				1	11	3	8	.....				0	7	3	5
	SERIES 2. With direct mineral manure:																				
8	Mixed mineral manure,†	1	10	2	13	1	12	2	26	1	16	1	22	1	13	1	2	0	9	0	27
9	Mixed mineral manure, and 2,000 lbs. sawdust,	1	13	0	15	1	15	2	18	1	19	0	8	1	15	3	23	0	11	3	20
10	Mixed mineral manure, and 200 lbs. each sulphate and muriate ammonia,	2	16	3	7	2	17	1	10	3	4	0	4	2	19	1	16	1	15	1	13
11	Mixed mineral manure, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. sawdust,	2	16	3	13	2	17	1	16	3	1	2	4	2	18	2	11	1	14	2	8
12	Mixed mineral manure, 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. cut wheat straw,	2	8	1	8	2	14	0	2	3	0	1	4	2	14	0	23	1	10	0	20
13	Mixed mineral manure, and 400 lbs. each sulphate and muriate ammonia,	3	2	0	26	3	1	3	24	3	7	0	4	3	3	2	27	1	19	2	24
14	Mixed mineral manure, and 275 lbs. nitrate of soda,*	.....				.....				1	17	3	8	.....				0	13	3	5
15	Mixed mineral manure, and 550 lbs. nitrate of soda,*	.....				.....				2	10	1	8	.....				1	6	1	15
	SERIES 3. With farm-yard manure:																				
16	14 tons farm yard manure,	1	15	3	26	2	7	2	8	1	17	0	20	2	0	0	27	0	16	0	24
17	14 tons farm-yard manure, and 100 lbs. each sulphate and muriate ammonia,	2	4	2	25	2	13	2	16	2	7	2	0	2	8	2	14	1	14	2	11

* The experiments with nitrate of soda were not undertaken until the third year (1858), and the land devoted to it had been unmanured during several preceding seasons.

† For further description of this and other manures, see *ante*, p. 206.

Its rains were, in April, above the average, in May very large, and in the final month, June, but small. The moisture in the atmosphere, as indicated by the dew-point, was generally comparatively low; and with this, the range of temperature above that point was also low.

The grass season of 1857 ranged higher, both in maximum and in minimum temperatures, and also in mean range, than that of 1856; and, in that of 1858, higher numbers still were registered in regard to these several characters; but especially to that of the maximum temperature of the final month, June, which in this third season, 1858, was very excessive. Both in amount and distribution of rain, April differed not very materially in the three seasons. May, as mentioned, gave in 1856 a very large amount of rain, and also a large number of rainy days. In the same month of 1857, with at the same time much higher temperature than in 1856, both the actual fall, and the distribution of rain, were very small. In May of 1858, again, with still higher temperature than in the same month of 1856, both the actual amount and the distribution of rain were pretty full. In June, 1856, with again lower temperature than in the other years, there was, after the very wet May, now but very little rain. In the warmer June of 1857, there was a fair amount of rain; and in the still hotter June of 1858, there was, after a moderately wet May, but little rain.

The three seasons were therefore very different from one another, both in actual character as to heat and moisture, and in the mutual adaptation of these two qualities. As has been observed, however, the gross amount of the heterogeneous produce, *hay*, did not differ very widely in the three seasons, though the acreage amount of *dry matter*, and consequently of carbon assimilated, was nevertheless notably less in the first, and colder and wetter season, 1856, than in either of the others. And, as will afterwards be seen, with the prevailing wet and cold of 1856, the percentage of dry matter in the produce was low, and that of the mineral matter, and of the nitrogen in that dry substance, high—characters which indicate comparatively backward conditions as to the stage of growth and the maturation of the plants. In a subsequent division of this report, we shall illustrate by pretty full detail on the point, the fact that the proportions of the different descriptions of herbage, as well as the character of the development of each, were very much affected within equal periods of the season, according to the kind of manure employed. Had we equal

means of deciding upon the varying character of the produce dependent on the varying character of the seasons, there can be little doubt that the produce of these three very different seasons would show great difference, both as to the relative amounts of the various plants developed, and as to the character of the development of each.

Directing attention now to the comparative effects of the different *manures*, little more need be said as to the produce of the individual seasons. The results, as between one condition of manuring and another, will be both better and more easily traced by confining attention to the column showing the *average annual produce over the three years*, and to the concluding one of the table (1), showing the *average annual increase by manure*. These records relate, as will be remembered, to the produce of one cutting only. An estimate will be given, further on, as to the actual and relative amounts of hay to which the after feed on the several plots was probably equivalent. At present it is only necessary to consider how far the consumption of the after-grass upon the land should influence the judgment to be formed of the effects of the different manures, according to the weights of the produce of the first crop alone. On this point it may be remarked that the knowledge we possess as to the average proportion of the nitrogen and of the mineral matter of the food consumed by stock, which they probably finally store up in their bodies, (and in the case of nitrogen exhale), is such as to lead to the conclusion that the land would lose comparatively little of these manuring substances by the consumption upon it of the after-grass by sheep. By far the larger proportion of these contained in the second crop of one year would, therefore, remain towards the produce of the first crop in the succeeding year. Taken over a series of years, the annual produce yielded in the first crop will thus pretty closely represent the average annual result of the manure on any particular plot; at any rate, sufficiently so for a general comparison of the effects of one manure with that of another.

On one of the unmanured plots the average annual produce of hay was 1 ton, 3 cwt., 1 qr., 10 lbs.; and it varied but little from year to year. The duplicate unmanured plot was somewhat shaded from the afternoon sun. It gave, in the first two years, about two cwts. less of hay annually per acre than the other, but in the third year, as much as eight cwts. of hay more. The fact was, as the result of the after-feeding showed, that this second plot, though it gave less mown hay in the first two years than the first plot, gave,

on the other hand, more after-grass in those years. Hence there was less removal from the land in the first two years, and, compared with the other plot, some accumulation of manuring matter for the first crop of the third season. The average annual yield of mown hay on the duplicate plot was, however, only one and three-eighths cwts. more than on the other. The mean of the two may, therefore, be fairly taken as the average annual yield of the land and seasons in question. This amounted to one ton, four cwts., and three pounds of hay, as the standard unmanured produce of the experimental meadow land.

Sawdust contains very little of either nitrogen or mineral matter; but, upon high authority, it has been stated to produce great effects as manure, by virtue of the solvent action of the carbonic acid it yields in its decomposition upon the mineral constituents of the soil. The plot where there were employed per acre annually two thousand pounds sawdust (containing four to five pounds of nitrogen), yielded, however, an average annual produce of about three and one-half cwts. *less* hay than the unmanured land. Where two thousand pounds of sawdust were employed *with ammoniacal salts*, (plot 5), there were only six pounds per acre per annum more produced than where the same description and amount of ammoniacal salts were used alone (plot 4). When the same amount of sawdust was added with a liberal mineral manure (plot 9), the mixture gave annually about two and five-eighths cwts. more hay than when the same mineral manure (plot 8) was used alone. Lastly, when the sawdust was employed in admixture with both the ammoniacal salts and the mineral manure, (plot 11), the produce per acre per annum was about three-fourths of a hundred less than when the same ammoniacal salts and mineral manure (plot 10) were used without the sawdust. The nearly a ton per acre of organic matter, rich in carbon, in the form of sawdust, was then practically of no avail.

As the previous enumeration and the table show, the ammoniacal salts employed consisted of an equal mixture of the sulphate and muriate of ammonia of commerce. This mixture is reckoned to contain about twenty-five per cent of ammonia, which is equal to about 20.5 per cent of nitrogen. The four hundred pounds of ammoniacal salts per acre per annum, as used on several of the plots, would therefore bring annually on to the land about one hundred pounds of ammonia.

Where the four hundred pounds of ammoniacal salts were used alone (plot 4), they gave an average annual *increase* of eleven

cwts. of hay. The average annual *produce* by the ammoniacal salts, was one ton, fifteen cwts. of hay.

The "*mixed mineral manure*" alone, (plot 8), which contained an ample supply of acid, phosphate and sulphate of lime, and of potash, soda and magnesia, in the form of sulphates, but which did not afford, in a direct manner, an increased supply of available silica, gave an average annual increase of about nine and one-fourth cwts. of hay per acre.

The ammoniacal salts alone, it has been seen, gave an annual increase of eleven cwts. of hay; only one and three-quarters cwts. more, therefore, than purely mineral manures. It will be shown, however, in some detail, in a subsequent section, that the description of the increase differed extremely in the two cases. In fact where the ammoniacal salts were employed the increase was exclusively due to the increased growth of *graminaceous plants*, the so-called *natural grasses*, there being scarcely a *leguminous* plant to be found upon the plot. Where the purely mineral manures were used, on the other hand, the *grasses*, properly so called, were observed scarcely to have increased at all, whilst the whole plot was thickly covered with perennial red clover (*Trifolium pratense perenne*,) and some other leguminous plants. Such a result is perfectly consistent with what has been before established regarding the (so to speak) characteristic adaptation of mineral and nitrogenous manures respectively, to those crops of the respective families which are grown in our rotations.

Mineral manures alone have then much increased the growth of the leguminous plants on the meadow land. They enabled the graminacious ones, on the other hand, to assimilate but little more of nitrogen or carbon from natural sources, than did the normal supply of available mineral constituents in the unmanured land. Very different was the action of mineral manures upon the growth of the graminaceous plants of the meadow, when those manures were associated with a liberal artificial supply of *available nitrogen*. In the case of experiments both upon wheat and upon barley too, it has been shown that the land experimented upon was competent, for a series of years, to yield up, annually, enough of mineral constituents for a considerably larger crop than could be grown under the influence of the annually available natural supplies of nitrogen alone. The annually available mineral constituents were, however, not sufficient for such full crops as the seasons would yield, *when there was a liberal artificial supply of available nitrogen*. There appear to be obvious reasons

why this should be expected to hold good to a greater extent with *meadow grass* than with these graminaceous corn crops. In land of pretty equal original characters, the amount of mineral matter taken annually from a given area in grass (mown for hay,) is, under the same annual climatic circumstances, much greater than that taken off in the corn and in the straw of the seeding crop. The mechanical operations, and the exposure to the atmosphere, in the case of the arable land, would appear to indicate a greater annual disintegration and liberation of total mineral constituents over a given area, though not perhaps more within the limits of the immediately superficial layers. In the case of meadow grass, therefore, the original characters of the soil and the seasons being equal, both the annual demand for mineral constituents would be greater, and the total annual yield of them from the soil would be less, than in the case of the cereal crop.

Consistently with the foregoing considerations, it was found, that although the ammoniacal salts, when used alone, gave an annual increase of only eleven cwts. of hay. The same amount of ammoniacal salts, when in conjunction with the "mixed mineral manure," (plot ten) gave an annual increase of one ton fifteen and three-eighths cwts. of hay. Thus, the combination of ammoniacal salts and the mixed mineral manure gave more than three times as much increase as the ammoniacal salts alone, and four times as much as the mineral manure alone. The average annual produce by the mixture of the ammoniacal salts and mineral manure, amounted in fact to within less than a hundred weight of three tons of hay per acre, by the side of one ton four cwts. per acre on the continuously unmanured land.

Now, this produce by the mixed mineral manure and ammoniacal salts (plot ten), consisted almost exclusively of graminaceous plants. There was scarcely a clover or any other leguminous plant to be found upon the plot. The action of the mineral manures, in this conjunction, with ammoniacal salts, was *not*, therefore, to yield increase by aiding the development of leguminous plants, as was the case when the same mineral manures were used alone. The mineral manure has now acted, by supplying within the reach of the plants a sufficiency of certain mineral constituents, to enable the graminaceous plants to appropriate, and turn to the account of growth, a much larger portion of the *artificially supplied nitrogen* than they could do when the ammoniacal salts were used alone. In fact there were one ton four and one-quarter cwts. per acre per annum more graminaceous hay

grown when the artificial supply of nitrogen was accompanied by a liberal artificial supply of certain mineral constituents, than when it was not so accompanied.

It has been shown that the mineral manures had little or no effect in increasing the assimilation of nitrogen by the meadow grasses, when that constituent *was not artificially supplied;* on the other hand, they very considerably aided that assimilation when available nitrogen *was artificially supplied.* It has also been shown that the addition to the mixed mineral and nitrogenous manure of a large quantity of saw-dust—a substance rich in carbon—did not further increase the produce. In fact neither did the saw-dust (whether alone or in admixture,) seem to aid the solution of mineral constituents by the evolution of carbonic acid; nor did this possible source to the plant, of carbonic acid itself, seem to have been of any avail.

The addition to the mixed mineral and ammoniacal manure, of an equal weight of cut wheat-straw instead of saw-dust (plot twelve), was equally without effect with that of the latter substance. Indeed, notwithstanding the large amount of mineral constituents, and especially of silicious compounds contained in the cut wheat-straw as compared with the saw-dust, there was, whether compared with the produce by the mixed mineral and nitrogenous manure, or with that by the mixed mineral and nitrogenous manure and saw-dust, an average annual deficit of four to five cwts. of first crop hay where the cut wheat-straw was employed. The plot with the cut wheat-straw, like the duplicate unmanured one, was, however, somewhat shaded, and like the latter, though it gave a somewhat deficient first crop, gave at the same time rather more after-grass than the plots most comparable with it. It remains to be seen, therefore, whether the less exhaustion by the first crop hitherto, and the greater return of constituents as manure in the consumption of the second crop, will not, before long, tell upon the amount of produce of the first crop, and how far the inefficiency of both saw-dust and cut wheat-straw was due to the slowness of their decomposition, will perhaps be apparent in the course of years.

The mixed mineral manures in conjunction with 400 lbs. per acre, per annum, of ammoniacal salts, gave an annual *produce* of more than two tons nineteen cwts., and an annual *increase* (over the unmanured,) of one ton fifteen and three-eights cwts. of strictly graminaceous hay. The same mineral manures, together with double the above amount of ammoniacal salts, gave even

more produce and increase still. The mineral manures and the double supply of ammoniacal salts, gave, on the average, three tons and three and three-quarters cwts. of annual *produce*, and one ton nineteen and three-quarters cwts. of annual *increase* of graminaceous hay.

When we bear in mind the fact, that the mixed mineral manure alone scarcely increased the graminaceous produce at all, it would appear that the increase of such produce, upon the super-addition of the 400 pounds, or of the 800 pounds of ammoniacal salts, was, (so far as its nitrogen was concerned,) at any rate, mainly due to that which was thus *artificially supplied.* Assuming this to have been the case, it would result that the first increment of 400 pounds of ammoniacal salts, (100 pounds ammonia,) yielded an increase of one ton fifteen and three-eighths cwts. of hay, but that the second increment of the same amount, gave a further increase of only four and three-eighths cwts. The two together, as above stated, gave one ton nineteen and three-quarters cwts. of increase. As the nitrogenous supply was increased, the effect of a given amount of it was therefore very greatly diminished. Nor is this result to be attributed to a deficiency of mineral constituents, where the larger amount of ammoniacal salts was employed. The produce on the addition to the mineral manure of the *smaller* amount of ammoniacal salts, was indeed quite as heavy, if not heavier, than the soil and seasons were suited to mature advantageously. Further evidence on the point will be adduced in a subsequent section of the report. But it may be here stated in passing, that the crop grown by the larger amount of ammoniacal salts—supplying as it did, the enormous quantity of 200 pounds of ammonia per acre per annum—was so over-luxuriant, as to be much laid, matted together, and dead at the bottom, some time before the bulk was ready for cutting.

It has been already stated, that the trials with *nitrate of soda* were not commenced until the last of the three seasons, over which the other experiments extended. The nitrate too, was sown about a week later than the other manures. The result of this single season's trial with the nitrate was, that a given amount of nitrogen so supplied, did not increase the produce of hay equally with the same amount in the form of ammoniacal salts. Still the influence of artificial nitrogenous supply upon the grass crop is here again illustrated.

Nitrate of soda, in amount supplying nitrogen equal to about fifty pounds of ammonia per acre, (plot six,) gave scarcely any

increase whatever, over the *mean* unmanured produce of the same season. It will be remembered, however, that in this third season, the duplicate unmanured plot gave an obviously somewhat excessive produce of hay; it having given smaller *mown* crops than the other in the preceding season, but more after-feed, and hence the condition of the land on the duplicate plot would be relatively somewhat too high for the third mown crop. Double this amount of nitrate of soda, (plot seven,) containing nitrogen equal to the ammoniacal salts of (plot four,) gave about three and three-quarter cwts. less increase of hay per acre, than the equivalent amount of ammoniacal salts. When the smaller amount of nitrate of soda was used in conjunction with the "mixed mineral manure," the produce amounted to one ton seventeen and three-quarters cwts. of hay, or to eleven and one-half cwts. more than when the same amount of nitrate was used alone. Lastly, with the larger amount of nitrate of soda, (equal in nitrogen to the 400 pounds of ammoniacal salts,) together with the "mixed mineral manure" (plot fifteen), there were two tons ten and three-eighths cwts. produce, instead of one ton eleven and three-quarters cwts. by the same amount of nitrate of soda without the mineral constituents. This increased produce by the nitrate of soda and mineral constituents was, however, considerably less than either the average annual yield, or that of the third season taken alone, by an equal amount of nitrogen in ammoniacal salts, with the mineral manure in addition. So far, however, as the action of the manures applied in such full quantity is cumulative from year to year, it will of course to that extent be illegitimate to draw any strict comparison between the produce of one manure in its third season, and that of another in its first season of application. The character of nitrate of soda as an efficient grass manure, and as acting both on this and other crops, by virtue of the nitrogen it contains, is too well established by other experiments—indeed by common experience also—to admit of doubt. It remains to be seen, what will be the comparative effects of a given amount of nitrogen supplied in nitrate of soda and in ammoniacal salts respectively, when the trials have been continued over numerous and various seasons.

Before leaving the results with the nitrate of soda, it should be stated that it had the same effects as the ammoniacal salts, in discouraging the growth of the leguminous herbage, and in encouraging that of the graminaceous plants or grasses. The increase of action when the mineral constituents were added to the

nitrogen in the form of nitrate, was, therefore, as in the case of their addition to the ammoniacal salts, *not* to be attributed to their enabling graminaceous plants to take up more nitrogen *from natural or unaided sources*, but to their supplying, within a limited range of the soil, the mineral constituents requisite for the efficient action upon the collective and assimilative processes of the plants, of the *nitrogen artificially supplied.* It will be shown on a future occasion, that the *percentage* of nitrogen in the dry substance of the hay, grown both by ammoniacal salts alone, and by nitrate of soda alone, was comparatively very high, in fact, considerably higher than when the mineral manures were also employed, whereby the graminaceous produce was much increased. So far, then, as there was an excessive amount of nitrogen, in the form of elaborated nitrogenous vegetable compounds, where the supplied nitrogen was liberal, the mineral constituents in defect, and the growth restricted thereby, it was that there was a relative deficiency in the formation of the non-nitrogenous vegetable substances.

Attention has now been called to the annual amount of hay obtained both without manure, and by the use of certain individual, or classified constituents of manure. In this way, some information has been acquired as to the manurial requirements for the growth of a heavy produce of the crop in question. Let us now examine: What were the effects upon the hay crop of that complex substance, *farm-yard manure?* And, bearing in mind the facts already brought to view, in regard to the action of certain individual manures, let us endeavor to form a judgment as to which of the constituents, or classes of constituents, of farm-yard manure, its effects upon the hay crop are mainly, or at any rate characteristically due.

The annual application of fourteen tons of farm-yard manure per acre, gave, over the three years, an average annual produce of two tons and one-quarter cwt. of hay, equal to sixteen and one-quarter cwts. per acre per annum more than the unmanured plot. This increase by farm-yard manure is greater than that by either the mixed mineral manure alone, or the ammoniacal salts alone; but it is less than half the increase obtained when these two descriptions of manure were used conjointly. This increase of sixteen and one-quarter cwts. of hay per annum, by the use of fourteen tons of dung is, it will be seen, little more than one cwt. of hay for every ton of the manure employed.

It has been seen that *carbonaceous substances*, whether applied

in the form of sawdust or of cut wheat straw, had little or no effect upon the hay crop. It is probable that the carbonaceous substance of the dung would yield up its carbon in the form of carbonic acid, or of other products of decomposition, more readily than that of either of the substances just mentioned. But the farm-yard manure contained, besides carbonaceous substances, a large amount of both mineral constituents, and of ammonia, or nitrogen in some form. It has been seen, too, that these latter substances, when used without carbonaceous matter, gave greatly increased crops of hay. Under these circumstances, we can hardly hesitate to attribute the main effects of the farm-yard manure upon the hay crop, rather to the conjoint action of its mineral and nitrogenous constituents than to its enormous bulk of carbonaceous substances.

That the *mineral* constituents of the dung had their share of effect, would appear from the fact, that the leguminous herbage was moderately luxuriant on the dung plot, and that those of the grasses were the most developed, which were increased in their proportion to the rest by the artificial mineral manures. And again, that the nitrogen also of the dung was effective, may be judged, not only from the general development of the graminaceous plants under its use, but from the fact of a like fullness in the proportion of the grasses in *flowering and seeding stem*, as where the ammoniacal salts were employed in conjunction with the mixed mineral manure. It would appear, however, that a much less proportion of the whole nitrogen supplied to the land was active, when it was provided in the form of farm-yard manure, than when in that of ammoniacal salts. There would, in fact, be considerably more of nitrogen applied per acre in the fourteen tons of farm-yard manure, than in the 400 lbs. of the mixed ammoniacal salts. Nevertheless, the encouragement of the leguminous plants was much greater, and that of the graminaceous ones much less, where the farm-yard manure was employed, than where the 400 lbs. of ammoniacal salts, together with the mixed mineral manure, were used.

That the less produce by the farm-yard manure, than by the mixed mineral manure and 400 lbs. of ammoniacal salts, was due to a deficiency of *available* nitrogen, notwithstanding the large actual *amount* of it in the dung, would appear from the fact, that on the employment of 200 lbs. of ammoniacal salts *in addition* to the farm-yard manure (plot 17), there was a further average annual increase of $8\frac{3}{8}$ cwts. of hay per acre. Still, even with this addi-

tion, there was about half a ton less of hay annually, than where the "mixed mineral manure" and the 400 lbs. of ammoniacal salts were applied.

The evidence regarding the action of the farm-yard manure goes to show, that, though it is doubtless a very complete and important restorer of both the mineral constituents and the nitrogen required to repair the exhaustion of this most greedy crop, yet the amount of these constituents supplied by its means is proportionally much less active within a given time, than that provided in the artificial combinations. As, however, permanent meadow-land, especially when attached to an arable farm, does not, as practice goes, so much as a matter of course, come in for a due periodic supply of farm-yard manure as does the land under rotation, it becomes far more necessary in its case, to bestow special consideration that the mineral constituents be not exhausted, than in that of rotation crops under ordinary good management. In fact, the grass land of the arable farm is but too frequently looked upon as the legitimate sphere for robbery for the other crops. Indeed, considering the nature of the exhaustion of permanent grass land generally, when mown for hay, and at the same time bearing in mind the character of the artificial manures, which are, in point of economy, at the command of the farmer, it would seem that the *permanent* condition of such land should be kept up by farm-yard manure, stable dung, town manures, and the like, and the *active growth* aided, year by year, by the so-called artificial, nitrogenous—or, better still, nitrogenous and phosphatic manures. Where hay is grown for the supply of a neighboring town, the (in the above sense) permanent condition of the land is very generally maintained by town manures of some kind brought by the return carriage. But where hay is grown on an arable farm, and is mown for consumption by the stock (or still worse, for sale), the return is but too often by no means so complete. The question of keeping up the fertility of grass land by sewerage, or other irrigation, is one of course of entirely separate consideration from that now before the reader.

Before giving a summary enumeration of the results and conclusions thus far indicated, it will be well to direct attention to the relative, and, as far as they can be estimated, the *actual* amounts of after-grass yielded, on the differently manured plots.

In Table II, are given:—

Experiments with different Manures on Permanent Meadow lands.

TABLE 2 —*Showing the number of sheep fed by the after-grass, and the quantity of hay to which it is estimated to be equivalent.*

Plot Nos.	MANURES. (Per acre, per annum.)	Actual particulars of the feeding.						Calculated results.				
		Area of plots.	1856. Sheep put on Oct. 10.		1857. Sheep put on Sept. 23.		1858. Sheep put on Oct. 18.		No. of sheep kept for one week, per acre.			
			Number of sheep.	No. of days feeding.	Number of sheep.	No. of days feeding.	Number of sheep.	No. of days feeding.	1856	1857	1858	Average annual.	Est'd av. am't of hay per acre, per an'm, in the aftergrass.*
	SERIES 1.—Without direct mineral manure:	Acre											Lbs.
1	Unmanured,	1-4	10	13	8	13	10	12	37.1	29.7	34.3	33.7	539
2	Unmanured (duplicate plot),	1-4	10	17	10	13	† 9 $\frac{1}{2}$	12	48.7	34.3	32.6	38.5	617
	Mean or standard unmanured,		10	15	9	13	† 9 $\frac{1}{2}$	12	42.9	32.0	33.4	36.1	578
3	2,000 lbs. sawdust,	1-2	20	13	16	13	16	12	37.1	29.7	27.4	31.4	503
4	200 lbs. each sulphate and muriate ammonia,	1-2	20	14	20	13	20	12	40.0	37.1	34.3	37.1	594
5	200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. sawdust,	1-2	20	14	20	13	20	12	40.0	37.1	34.3	37.1	594
6	275 lbs. nitrate of soda,	1-6	....	....	....	....	60	1	....	....	51.4	51.4	823
7	550 lbs. nitrate of soda,	1-2	....	....	....	....	60	1	....	....	51.4	51.4	823
	SERIES 2.—With direct mineral manure:												
8	Mixed mineral manure,	1-2	20	14	25	13	25	12	40.0	46.4	42.9	43 1	689
9	Mixed mineral manure, and 2,000 lbs. sawdust,	1-2	20	14	25	13	25	12	40.0	46.4	42.9	43.1	689
10	Mixed mineral manure, and 200 lbs each sulphate and muriate ammonia,	1-2	30	11	30	12	30	12	47.1	51.4	51.4	50.0	800
11	Mixed mineral manure, and 200 lbs. each sulphate and muriate ammonia, and 2,000 lbs. of saw dust,	1-2	30	11	30	12	30	12	47.1	51.4	51.4	50.0	800
12	Mixed mineral manure, and 200 lbs. each sulphate and muriate ammonia, & 2,000 lbs. cut wheat straw,	1-2	30	17	30	13	30	12	72.8	51.4	51.4	58.5	937
13	Mixed mineral manure, and 400 lbs. each sulphate and muriate ammonia,	1-2	40	11	40	12	40	12	62.9	68.6	68.6	66.7	1067
14	Mixed mineral manure, and 275 lbs nitrate of soda,	1-6	....	....	....	....	60	1	....	....	51.4	51.4	823
15	Mixed mineral manure, and 550 lbs. nitrate of soda,	1-6	....	....	....	....	60	1	....	....	51.4	51.4	823
	SERIES 3.—With farm-yard manure:												
16	14 tons farm-yard manure,	1-4	10	13	12	13	11	12	37.1	44.6	37.8	39.8	638
17	14 tons farm-yard manure, and 100 lbs. each sulphate and muriate ammonia,	1-4	10	13	12	13	11	12	37.1	44.6	37.8	39.8	638

* The calculation is made on the assumption that each sheep would eat grass equal to 16 lbs. of hay per week.

† One sheep was taken from this plot to be killed when it had been only half the period feeding.

In the first division—the actual number of sheep that were put upon each plot of after-grass, and the actual number of days they were fed upon it, in each of the three seasons of the experiments.

In the second division—the number of sheep calculated to be kept per acre, on each plot for one week, in each of the individual seasons, and on the average of the three seasons; and in the last column of the table—the estimated average annual amount of hay per acre, to which the after-grass consumed would be equivalent, reckoning the sheep to eat grass equal in amount to sixteen pounds of hay per head, per week.

Calculating the after-grass into its assumed equivalent of hay, as above described, the result is, of course, only an approximation to the truth. Looked upon as such, it is not without its value and interest. The so-estimated amount of after-feed on the respective plots show, as compared one with another, relations very coincident, in general direction, with those indicated by the mown first-crops of hay.

It has already been noticed that the produce of first crop hay on plot two, (the duplicate unmanured plot), was less in the first two seasons, and more in the third, than on plot one, the other unmanured one. Table II, shows, on the other hand, that there was rather more after feed in the two first seasons, on the duplicate unmanured plot, than on the other. Taking the mean of the two plots, the unmanured land shows an average annual yield of after-grass, equal to 578 lbs. of hay. The sawdust plot, as in the first crop, so again in the second, gives rather less produce than the unmanured one. The ammoniacal salts alone gave rather more after feed than the unmanured plot; and the ammoniacal salts and sawdust gave the same amount as the ammoniacal salts alone. The plot with the "mixed mineral manure" alone, with its luxuriant leguminous herbage, gave more after feed than the one with ammoniacal salts alone. The addition of the sawdust to the "mixed mineral manure" gave no further increase. The plot with both the "mixed mineral manure" and the 400 lbs. of ammoniacal salts, as in the first crop, so now in the second, gave more produce than either of the plots where the respective manures were used separately. The addition of sawdust to the mixture of the two manures gave no further increase. The addition of cut wheat straw, instead of sawdust, showed some advantage in the second crop, the produce in the first crop being somewhat deficient. The combination of the "mixed mineral manure," and the double amount (equal to 800 lbs. per acre) of

ammoniacal salts, gave the largest amount of first crop hay, and now again the largest amount of after-grass, of any manure in the series.

The nitrate of soda, which was used only in the third season, and then yielded less of first crop hay than an amount of ammoniacal salts equal to it in contents of nitrogen, appears, according to the figures in the table, to have given, on the other hand, a larger amount of after-grass. As, however, a large and equal number of sheep was put upon each of the nitrate plots, and *for one day only*, not even the relative amounts, still less the actual quantities recorded as estimated second crop hay, can be much relied upon in these cases of experiment with the nitrate.

The farm-yard manure plots gave, of second crop, as they did of first, a produce intermediate between that without manure, and that by the "mixed mineral manure" and 400 lbs. of ammoniacal salts.

Were these estimated amounts of hay in the second crop of the respective plots to be added to those actually removed in the first crop, the *comparative* action of the different manures as it would be then represented, would not appear to differ in any material point from that indicated by the amounts of hay actually taken off in the first crop. Independently of this, however, by far the larger proportion of both the mineral constituents and the nitrogen of the second crop would, as before stated, be returned to the land by the sheep feeding upon it. It would, therefore, obviously be a further deviation from the true representation of the actual facts, to take into account the estimated second crop as a part of the removed produce of the manures employed, than to omit it from the calculation altogether. These estimated amounts of second crop, varying as they do in the proportion of from one to two, according to the manure employed, are, nevertheless, interesting of themselves, as showing great differences in vegetable activity after removal of the first crops, depending, of course, on the varying character and amount of the residual or unused manure. They are, moreover, useful aids in forming a judgment respecting the comparative cumulative effects, from year to year, of the different manures. But when, in a subsequent part of this report, we come to consider the debtor and creditor account of certain constituents on the several plots—the relation of the amounts removed in the produce to those supplied in the manure—we shall assume the amounts taken off in the

increase of the first crop only, as the most nearly representing the gain due to the supply in the manure employed.

It is proposed, on a future occasion, to show the acreage amounts of certain constituents removed in the produce from the different plots, and the relation of these in the increase, to those supplied in the manures; to consider in some detail the varying description of the herbage according to the manure employed, and to show the consequent variations in the chemical composition of the complex gross produce, or *hay*. In the meantime, founded upon the evidence thus far recorded, relating to the amount per acre, and the general character of the hay obtained by the different manures, the following general results and conclusions may be enumerated: That the effect of a mixed, but purely *mineral manure*, upon the complex herbage of a permanent meadow land, was chiefly to develop the growth of the *leguminous* plants it contained; and scarcely at all to increase the produce of the *graminaceous* plants, or commonly called *natural grasses*.

That the action of purely *nitrogenous manures* upon the permanent meadow, was to discourage the growth of the *leguminous* herbage, and to increase the produce of the graminaceous hay.

That by the combination of both *nitrogenous and proper mineral manures*, the produce of *graminaceous* hay was very much increased. In the particular soil and seasons in question, the increase obtained by the combination, was far beyond the sum of the increase yielded by the two descriptions of manure, when each of them was used separately.

That *farm-yard manure* gave a considerable increase of chiefly *graminaceous* hay. In the soil and seasons in question, however, the artificial combination of nitrogenous and mixed mineral manure yielded a very much larger increase than an annual dressing of fourteen tons of farm-yard manure.

That peculiarly *carbonaceous manures* had little or no beneficial effect on the amount of produce of the hay. That the little effect (if any) which the carbonaceous manures did exhibit, seemed to be favored by admixture with mineral manures; and then (as when the mineral manures were used alone), it appeared to be the leguminous, rather than the graminaceous herbage, that was encouraged.

That the beneficial action of *farm-yard manure* upon the grass crop is to be attributed chiefly to its *mineral and nitrogenous constituents*, and comparatively little to its large amount of carbonaceous substance.

That the large increase of produce obtained by the *combination of nitrogenous and mixed mineral manure* being almost entirely *graminaceous*, the mineral manures, when in this combination, did not act as when used alone, in developing the highly nitrogenous leguminous herbage. The great increase in the produce of hay, obtained by the conjunction of the mineral with the nitrogenous manure, is to be attributed to the supply, within a limited range of the soil, of a sufficient amount of the necessary mineral constituents, to enable the *graminaceous* plants to turn to the account of growth *the nitrogen at the same time artificially supplied.*

The general result is, that the leguminous plants in the *meadow*, like those grown in our *arable fields*, were much increased in growth, and assimilated more nitrogen from the unaided sources over a given area, when they were liberally supplied with certain *mineral* or *primarily* soil constituents.

At the same time, notwithstanding the high (both percentage and acreage) yield of nitrogen in leguminous produce generally, the increased growth of the *leguminous herbage of the meadow* was not favored by the direct supply of the nitrogenous manures, a result which is again very similar to that obtained with the *leguminous crops of our rotations.* On the other hand, the graminaceous hay *plants*, like the graminaceous *corn crops of our rotations*, assimilated but little more nitrogen from natural sources, under the influence of liberal supplies of purely mineral manures, they gave a largely increased growth, only when there was an artificial supply of *available nitrogen within the soil;* and when this was provided, the direct supply of mineral constituents was essential to its full effects.

The more practical conclusions may be very shortly stated. In order that the more temporary, or more rapidly acting means of increasing the produce of meadow land, may have their full effect, the more permanent means of amelioration that may be required, such as draining, marling, liming, and the like, must not be neglected. The application of bones is not recommended for general adoption. They appear to be chiefly adapted to the exhausted pastures of certain localities, and not to be generally applicable to meadow land which is mown for hay. The hay crop is a great exhauster of the mineral constituents of the soil; and these, owing to the high price of salts of potash, cannot, with profit, be fully restored in artificial manures. The return of the mineral constituents is better accomplished by means of farm-yard manure, stable dung, night soil, and the like, which, at the same time, bring

on to the land a more or less considerable quantity of available nitrogen. The best artificial manures for grass land, are Peruvian guano, which is rich in phosphates as well as nitrogen, and nitrate of soda, and sulphate of ammonia, which are rich in nitrogen, but contain, of course, no phosphates. Peruvian guano, when used alone, may be employed at the rate of from one and a half to two and a half cwts. per acre; nitrate of soda alone, or sulphate (or muriate) of ammonia, at the rate of one and a half to two cwts. per acre. The salts of ammonia are, however, relatively too expensive to be employed largely with profit; and both ammoniacal salts and nitrate of soda are more advantageously used in combination with guano. A very generally useful top-dressing for the hay crop may be made of three parts Peruvian guano, one part nitrate of soda, and one part sulphate of ammonia. Of this mixture, two to two and a half cwts. per acre may be employed. With this applied annually, and the application of ten or twelve tons per acre of good rotten dung once every four or five years, a good crop of hay may be taken off every year without injury to the land. The best time of sowing the "artificial manures," is generally in January; and it should at any rate be seldom postponed beyond February.

DRAINING.

WILLIAM JOHNSON'S REPORT.

First Premium.

The annexed map (or plan) shows the number of drains and their courses, in a lot containing nine and one-half acres, which lot has a gentle slope to the east, the eastern part being quite flat. Soil, sandy loam; sand predominating in some places.

Subsoil, clay and sand, but mostly clay. Have never been able to raise a good grain crop on the lot. I knew that it wanted thorough underdraining, but have not been able with my other farm operations, to attend to it before the last season. The drains are about two rods apart varying a little according to the situation of the ground, and are, on the average, two and one-half feet deep. The lateral drains are all laid with two inch pipe tile. Main drains with six inch horse shoe tile, laid on boards. The expense of the work and material is as follows, to wit:

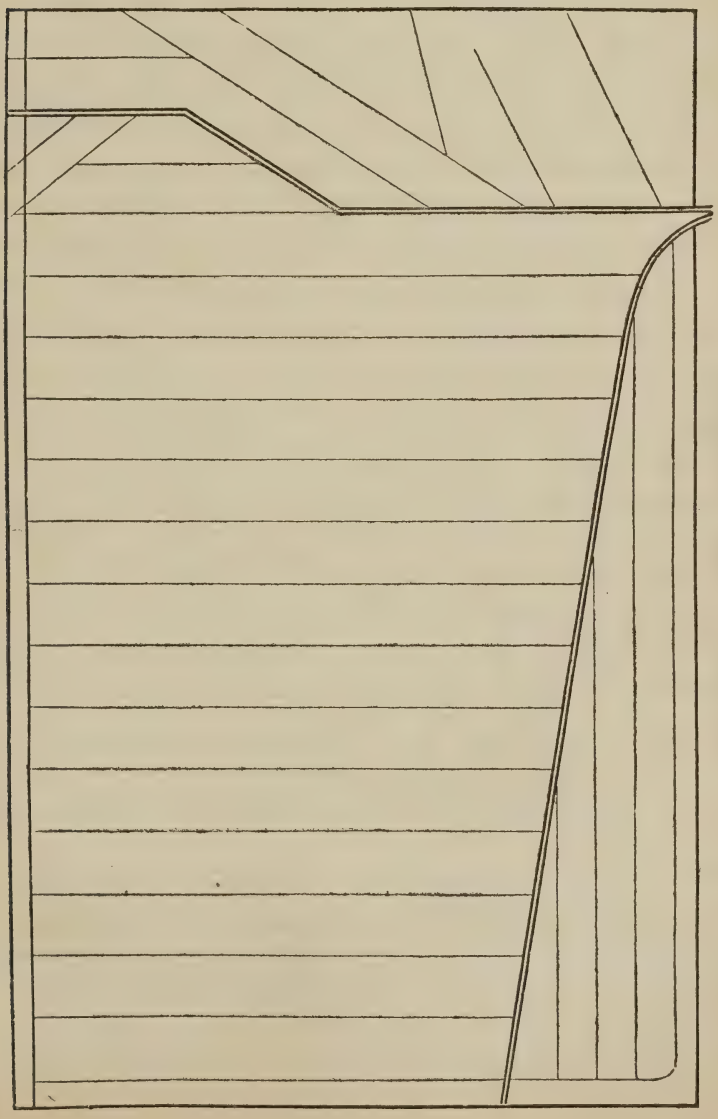
Digging 212 rods, by hand, 15 cts. per rod,	$31 80
2,968 two inch tile at $10 per thousand,	29 68
Laying tile and covering same,	8 48
Drawing tile,	6 00
Showing the expense to be about 35½ cts. per rod,	$75 96
Digging 392 rods, with machine, 8 cts. per rod,	$31 36
5,482 two inch tile, $10 per thousand,	54 88
Laying and covering 4 cts. per rod,	15 68
Drawing tile,	11 00
Showing the expense to be about 28 cts. per rod,	$112 92
Digging 144 rods, main drain, 15 cts.,	11 60
2,016 six inch tile $25 per thousand,	50 40
Laying and covering 5 cts. per rod,	7 20
Drawing tile,	6 00
2,304 feet of lumber for tile,	23 04
Drawing same,	2 50
Expense of main drain, 70 cts. per rod,	$100 74

Recapitulation.

Cost of lateral drains dug by hand, 35½ cts.,	$75 96
Cost of lateral drains dug by machine, 28cts.,	112 92
Main drains dug by hand,	100 74
	$289 62

Which shows the expenses to be about $30\frac{50}{100}$ per acre. Of course I can't say what effect the drains will have upon the soil, as they were made last season, but my experience teaches me that the increase in the first three crops will pay for the expense of the drains. WILLIAM JOHNSON.

We have examined the statement, and have no hesitation in saying that Mr. Johnson is entitled to the first premium for the best experiment in underdraining. J. TURRILL,
T. C. PETERS.



WM. JOHNSON, GENEVA. Plan of Drains.

JONATHAN TALCOTT'S REPORT.

Second Premium.

ROME, *November 10th*, 1858.

B. P. JOHNSON, *Sec'y N. Y. S. Agricultural Society.*

Dear Sir—I wish to be considered a competitor for the premium offered by the New York State Agricultural Society, on draining. During the past year I have drained about twenty-five acres. The ditches were about two feet nine inches deep on the average, and forty feet apart, making sixty-six rods per acre, at an expense of forty cents per rod for tile; and I calculate the same for stone. In order, however, to have the stone drains as cheap as forty cents per rod, it becomes necessary to charge to the field cleared of stone for the picking up of the same, which I think is but a fair charge, and one that will be well paid for in getting the stone from the surface if in meadow, for the privilege of running the mower over it for three years; and in the increased crop of hay cut in that time.

My plan is to have all stone drains three feet to three and a half feet deep; and lay a channel for the water, with a flat stone against each side, and then a pointed stone resting on the bottom, in the middle of the ditch, and leaning against the sides, so as to press firmly against the flat stones of the sides; then a large round one in center, as shown in cut, leaving three apertures or channels for water courses; then fill to within twenty inches of the surface with small stones; cover with coarse grass or straw, and fill in with earth, and you have a drain that I think will last an age, if put in a firm soil; and stones should never be put in any other, as in sand or muck they are easily filled by the dirt, from mice and moles that infest light soils when drained; and a stone drain should never be filled nearer than eighteen to twenty inches of the surface to be durable. Drains put in in this manner ten years since, are now as good as the day first put in, to all appearance; and, in judging the future by the past, I cannot see why they will not last a century.

The tile are put in in the ordinary manner, care being taken to have a good fall and outlet, with as many drains discharging at a common outlet, as the nature of the ground and circumstances will admit; as it takes no more time to keep an outlet open that drains ten acres, than one that drains but one.

1. The land previous to draining was very wet in spring, winter, and fall, it being saturated with water; the soil composed of

clay, sand and gravel; mostly a clay subsoil; once in ten years, perhaps, a favorable season would enable me to grow a fair crop on it.

2. The method pursued, was to lay out the drains so that the outlets should discharge at the lowest places in the field, where the water can be freely discharged; then to run parallel drains at a distance of forty feet, centering in the main drains; which should be six inches deeper than the side ones, so they can freely discharge into them, which gives, as before stated, sixty-six rods per acre, and an expense of $26.40 per acre.

3. The result, thus far, is a dry soil, where, before, I had a mud hole, or mortar bed, as it was situated in gravel or clay. About two acres were sown to oats last spring, in good season, and, although the spring was uncommon wet, the oats did not suffer in the least, and a heavy crop was grown, free from rust or mildew. Ten acres are now sown to wheat and looks finely; and the balance is reserved for corn next season, on which I expect to grow a fine crop; the lands were nominally worth forty to fifty dollars per acre, when I began to drain; but in reality not worth (in their wet state) anything, as the expense of cultivating, with taxes and fencing, would be more than the crops would pay, at a fair compensation for labor. Now I hope to find them worth $100 per acre, in their increased productiveness, and ease of tillage for both man and beast. Some practical farmers have been over the grounds this fall, and they with one accord say the land is now worth $100 per acre, and will pay the interest of that amount and expense of working the same.

Lands drained by me ten years since, have paid the interest of $100 per acre, and the expense of cultivating, that, before draining, was worthless; and I think the land drained last year will be as valuable.

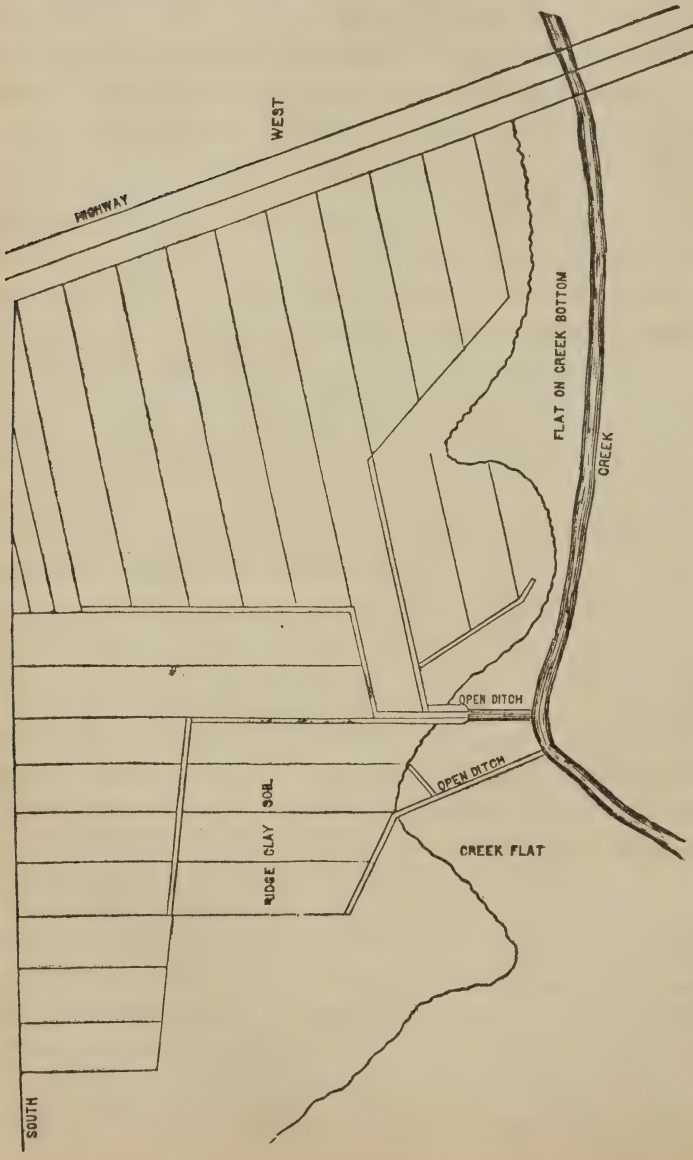
I would desire to say, that I consider tile the best article for draining, and the cheapest; I use sole tile, two inch for common drains, and for main drains, the quantity of water, and length of drain, must govern the size; it is best to err in too large a size, rather than too small; I would, however, use stones if they were plenty on the farm, and the nature of the sand would admit of their being used; that is, if a firm clay or gravel, free from quicksand or muck, and the proper depth could be dug, which should never be less than three feet, and three and a half feet would be better in my judgment. I consider that draining is the sheet anchor of good husbandry; without it, a high state of farming in this State cannot be attained.

JONATHAN TALCOTT.

Rome, *January 29th*, 1859.

B. P. Johnson:

Dear Sir—At your request I send you a map of one field of my draining operations for 1858. This field I design to plant to corn the coming season; the wheat field was laid out in a similar manner. The double lines indicate the main drains; they are in the lowest places, and are six inches deeper than the laterals; before commencing I had an engineer, with a level, to find exactly what



Plan of Drainage. JONATHAN TALCOTT'S Farm, Rome, Oneida County.

fall there was, and where to locate the main drains. I hope to be able to give a good account of crops next fall from the lands drained the past year, if my life is spared till that time. The south side is a gravelly ridge; on the east is the highway; on the north is a never-failing brook, with a flat three to four rods in width, with irregular indentures in the higher lands as indicated by the dotted irregular lines; the creek has been straightened as nearly so as can well be, keeping it near the center of the flat; the elevation of the table lands each side is about four feet; the outlets to the field, shown in the map, discharge into the creek at the lowest place; the bank is here four feet, which makes a capital outlet, running nearly straight down the creek, as shown by the bend in it at that place; having run an easterly direction, it here turns to the north, in which direction it runs till it leaves the farm; on the southeast is an arm of the swamp that extends several miles in length in this town. I have yet much land to drain, and feel confident that it will pay to do it, by my past experience, and shall do so as fast as my means will admit.

JONATHAN TALCOTT.

C. L. KIERSTED—Kingston, Ulster Co.

REPORT OF DRAINAGE—SWAMP LAND.—*Premium* $10.

On the subject of draining swamp or peat. I have on my farm some eighteen acres of such land, most of it covered with roots and stumps; the surface very soft—cattle or horses could not go upon it, except we had a long drouth, without becoming mired. So I, in company with a gentleman owning lands adjoining me, commenced digging a ditch some half a mile below, with a view of getting sufficient fall to allow us sufficient depth of ditch to drain our swamp. We dug 110 rods through our swamp, in addition to the long distance below, to get fall, at an expense of twenty-eight cents per rod through the swamp; the first part done by the day; we each paid one-half of the expense. I then went to work and cross ditched and drained some seven acres, (of which I had realized almost nothing for the three years I have owned it previous to this year); plowed it with a lap furrow, the sward being water grass. After preparing it in the usual way for planting, the most of it, I put a small handful of horse manure in each hill, covered it with the corn. I put in the horse dung with a view to warm the hill, and the experiment proved very satisfactory. The corn, where I put the manure, grew so stout most of it

lodged or went down. It yielded me some 185 bushels ears to the acre.

After preparing and planting to corn the piece mentioned, I took about five acres more, cut a ditch four and a half feet at top, three feet deep all around the piece, except the sides where the ditch was first dug; then took off the stumps and roots. Nothing would grow on the muck but a coarse kind of weed; there was no turf whatever on it. A part of which I put in turnips, a part in cabbage, and a part in buckwheat. The yield was very good, considering the time I got them in.

Later in the season I took the rest of the lot, ditched that as I did the aforementioned, drawed out the roots and stumps, and have plowed the whole lot ready for planting in the spring.

The expense of ditching, twenty days, lower end, at one dollar per day, one half paid by me,	$10 00
One-half of 110 rods, at 28c.	15 40
130 rods, at 20c.,	26 00
	$51 40

SOLOMON WALRATH—Canton, St. Lawrence Co.

REPORT OF DRAINAGE.—*Special Premium.*

B. P. Johnson, Esq.:

My Dear Sir—Regarding underdraining as one of the greatest desideratums connected with good farming, and not being any too well understood, at least not practiced by our farmers, I herewith send you, as briefly as possible, my method, having derived from my labors in this direction invaluable benefits.

The condition of most of the land prior to draining was entirely unproductive, nothing growing upon it but a worthless wild grass. The soil was a mixture of clay and sand, and impassable for teams. I commenced draining this piece by putting a main drain, at a cost of about fifty cents per rod, on the lowest portion, at a depth of from four to six feet, and three feet wide, running in a south-westerly direction. Instead of using tile, which are not necessary where stone abound, I laid stone on the sides of the drain at the bottom, from six to ten inches high, and covered with flat stones. The ditch was then filled up with small loose stones within a foot and one-half of the top. I then dug up coarse sods in the vicinity of the drain, and laid over the stones to prevent the earth from obstructing the drain. I then constructed other smaller drains, at about the same expense, leading into the main drain.

The result of these drains has enabled me to realize large and valuable crops, and to realize two crops of grass each season, averag-

ing from three and a half to four tons to the acre of good merchantable hay, where previously nothing but worthless wild grass grew. I raised during the past season, upon the ground in question, wheat at the rate of thirty-nine bushels and forty pounds to the acre.

I commenced these drains in the year 1848, and completed them in 1850. The two following years (1851 and 1852) the additional amount produced paid all expenses of the drains, and will continue to richly remunerate me for the expenditure. The piece above referred to contains about four acres.

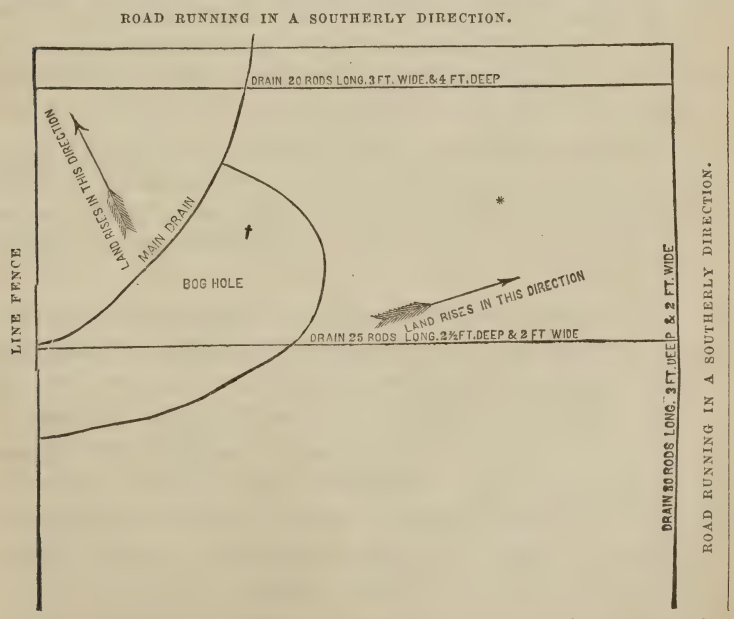
My neighbors were surprised that I should occupy so much of my time in these trivial expenditures of time and money, but the truth is, my pecuniary means formerly would not permit me to allow any of my soil to remain unproductive.

Accompanying this report you will find a diagram which will serve to show more clearly the position of the drained soil to which I have alluded. SOLOMON WALRATH.

St. Lawrence county, ss:

Solomon Walrath, being duly sworn, says that the statements contained in the foregoing report on draining are in every respect true, to the best of his knowledge and belief.

Sworn to before me, this 7th day of Jan., 1859. } C. VAN WATERS, *Justice of the Peace.*


ROAD RUNNING IN A SOUTHERLY DIRECTION.
DRAIN 20 RODS LONG, 3 FT. WIDE, & 4 FT. DEEP
LAND RISES IN THIS DIRECTION
MAIN DRAIN
BOG HOLE
LAND RISES IN THIS DIRECTION
DRAIN 25 RODS LONG, 2½ FT. DEEP & 2 FT. WIDE
LINE FENCE
DRAIN 80 RODS LONG, 3 FT. DEEP & 2 FT. WIDE
ROAD RUNNING IN A SOUTHERLY DIRECTION.

* This was *mostly* wild grass; is now the best land I have, i. e. the most productive.

† This, before draining, was all wild grass; it now produces two crops each season, and at the rate of three and a half to four tons to the acre.

POTATOES.

REPORT OF THE COMMITTEE ON MR. GOODRICH'S SEEDLING POTATOES.

The select committee appointed to examine several varieties of seedling potatoes presented by Mr. C. E. Goodrich, of Utica, Oneida county, N. Y., who has for several years been propagating from the ball, with the hope of producing a better variety than we have hitherto raised, and with particular reference to quality, productiveness and prevention of the rot, after discharging their duty, beg leave to report that Mr. Goodrich presented to the committee, ninety-nine varieties, selected, he says, from seventeen families and sub-families (and originally including a little over nine thousand varieties,) being the basis of his experiments. That in the numerous specimens exhibited almost all of them were in fine appearance and of rather large size. Among these ninety-nine varieties are seventeen, originated from 1849 to 1854, and out of which he has selected seven sorts for sale. These seven sorts are named and described in his sale bill presented to us. They have been before the public three and a part of them four years.

The committee beg leave to state, however, that having had no opportunity to test the different varieties, they take the recommendations of his correspondents, as presented to them and shown in his communications (see appendix at the end of the report).

Mr. Goodrich also presented eighty-two varieties of seedlings, originated in 1856, and including originally 1,300 of 9,000 above mentioned, embracing those from very early to very late; he finds these latter families producing much larger proportional number of good varieties than the earlier families did, because started from better bases. After the trial of another season he hopes to throw a large number of valuable varieties into market.

The committee were very much pleased with all the specimens presented by Mr. Goodrich, and he must have taken infinite pains to produce so many specimens and always of such fine appearance. It proves conclusively that he is not only an enthusiast on

the subject, and from the length of time, beginning in 1846, that he has not only a taste for the cultivation of this plant, but by his perseverance, is well calculated in the end to give the most valuable varieties. The potatoe itself entering so largely into the consumption of our people, it is all important both to their health and their pecuniary profit, that even he or some one else conduct these experiments to the end, if such be practical.

Mr. Goodrich, from his intelligence, his experience, and the innate love he has manifested for the cultivation of the potato, is, in the opinion of the committee, the proper person to whom this subject ought to be left. From his representations, which no doubt are true, of his debtor and credit account, he is evidently a loser (of which the people are reaping the benefit,) thus far by his experiments. The committee would therefore recommend to our brother farmers the purchase of his best varieties, and that the society award him a gratuity of one hundred dollars.

C. N. BEMENT,
J. P. BEEKMAN,
A. VAN BERGEN.
Committee.

NOTE.—Subsequently to the preparing of this report by the committee, Mr. Goodrich presented an abstract of his correspondence showing the success with which these varieties have been cultivated in places very remote from each other and from himself. A short abstract of this same correspondence was made by the committee which is here merged in the larger one presented by Mr. Goodrich. This correspondence relates mainly to their culture in 1857, a season very unfavorable to potato culture in the wide experience of our country; it also contains his reports for 1858, as far as yet received.

A digest of the returns relative to the culture of the seedlings referred to in the accompanying report of the special committee.

A description of the varieties of potatoes, the history of whose culture is given in this report:

1. The *Black Diamond* (a fanciful name).—This is a grand seedling of the Western Red, originated in 1852. It is round, dark purple, large yield, hardy, matures latish, bears no balls, vines and leaves dark green; plant early, in a dry warm soil.

2. The *Garnet Chili* (named from the garnet, a precious stone).—This was originated in 1853, from the Rough Purple Chili, a sort

imported from South America in 1851. It is round, light red, large yield, eminently hardy, matures with or a little before the season, bears no balls, vines and leaves light green, stems very stout. It is adapted to all soils and seasons beyond any sort known. The production of this variety cost 1,700 sorts, all the others being comparatively of little value.

3. The *Mountain June Pink Eye* (named from its parentage and appearance).—It was derived from the Mountain June in 1853. It is round or longish, white, with splashes of purple and pink eyes, enormous yield, latish, bears many balls, vines and leaves dark green, and needs much room ; plant early, and only in warm dry soils. This variety occasionally shows a dwarfed hill.

4. The *Utica Pink Eye* (named from its nativity and appearance,)—It is a brother of number one above. It is round, white, with splashes of pink and pink eyes, large yield, moderately hardy, quite early, no balls, vines and leaves darkish green.

5. The *Pale Blush Pink Eye*, (named from its appearance).—It was originated from the western red, in 1850. It is round, white, with a blush of red when wet, and faint, pink eyes, medium yield, moderately hardy, rather early, bears a few balls, vines and leaves light green.

6. The *Ovate Peruvian*, (named from its shape and parentage.)—It was originated in 1853, from a wild Peruvian. It is ovate, white, good yield, moderately hardy, rather early, bears a few balls, vines and leaves darkish green.

7. The *New Hartford*, (named from the town of New Hartford, adjacent to Utica.)—It is a brother of number six. It is longish, a little knotty, white, very large yield, moderately hardy, bears balls freely, vines and leaves light green. It has a wide adaptation to all soils and seasons.

8. The *Rough Purple Chili.*—This sort I imported from South America, in 1851. It was freely given out in 1853, '54 and '55. It is long, deep eyed, dark purple, rough skinned, very hardy and late. It is a very large yielder, but needs a good and warm soil, and should be planted early. It makes very stout, dark, upright vines, and always bears a few balls ; when grown large, it is liable to be hollow and prongy.

A digest of the returns of the culture of 1857, *unless otherwise stated.*

I.—Rhode Island.

Hon. Elisha Dyer, (Providence,) Corresponding Secretary Rhode Island Society of Agriculture, and Improvement of Domestic Industry, one bushel of seed, 1857.

1. "*Black Diamond.*—Large yield, some decay, a little knotty, quality fair, do not recommend for general culture.

2. *Gavnet Chili.*—Good yield, no rot, smooth, recommended for general culture.

3. *Mountain June Pink Eye.*—Good yield, no rot, smooth, rather strong, do not recommend for general culture.

4. *Utica Pink Eye.*—Moderate yield, smooth, no rot, recommend for general culture as an early sort.

5. *Pale Blush Pink Eye.*—Large yield, some rotten tubers, good quality, think favorable of it for general culture.

6. *Ovate Peruvian.*—Moderate yield, some disease, smooth, an average sort.

7. *New Hartford.*—Very large yield, no rot, some knotty, recommend for general culture."

Nothing is said of the weather, though it was undoubtedly bad.

Goodrich.

II.—Connecticut.

Henry A. Dyer, Corresponding Secretary Connecticut Agricultural Society, Hartford, one bushel, 1857.

1. "*Black Diamond.*—Good yield, a little disease.

2. *Garnet Chili.*—Very large yield, slight show of disease.

3, 4, 5 and 6, much disease, but fair yield.

7. *New Hartford.*—Fair yield and size, sound.

Season wet, soil a *heavy clay loam*, fortified with thirty loads of green, barn-yard manure to the acre."

This is my only bad report for 1857. With such weather, soil and manure, is there any wonder at the result? Goodrich.

III.—Massachusetts.

D. A. Bulkley, Williamstown, one bushel, 1857.

1. "*Black Diamond.*—Like it much, seventeen pounds from one hill, good health. 1858: Did not do quite so well.

2. *Garnet Chili.*—This is the best for all soils and weathers, good yield, good table sort. 1858: Has done wonderfully, large, sound, uniform; no small ones.

3. *Mountain June Pink Eye.*—Sound, yield equal to number one, but not as fine for table, good bearer.

4. *Utica Pink Eye.*—Sound, yield and value equal to number three.

5. *Pale Blush Pink Eye.*—Yield not large, one diseased tuber, fine texture, good table sort.

6. *Ovate Peruvian.*—Yield and health good, estimate it as number two above.

7. *New Hartford.*—Good health and yield. Too many in a hill. Never had so bad a season from beginning to end, as 1857."

Daniel Stanton, Stockbridge, one bushel, 1857.

1. " *Black Diamond.*—Large yield, sound.

2. *Garnet Chili.*—Very large yield, sixteen pounds giving four bushels.

3. *Mountain June Pink Eye.*—Health and yield good.

4. *Utica Pink Eye.*—Health and yield good.

5. *Pale Blush Pink Eye.*—Sound, yield very large.

6. *Ovate Peruvian.*—Best yield, three tubers, giving half a bushel. Nothing said of the weather, which was doubtless as bad as at Williamstown above.

C. W. Gleason, Worcester, one bushel, 1858.

I procured from Mr. Goodrich, of Utica, last spring, several new varieties of potatoes, (he had the whole list, except number six,) which bid fair to be of great value. Among the best is the Garnet Chili. For the last three years, from one-half to two-thirds of the *Davis' seedling*, have rotted here. (See Mr. Gleason's report in the Country Gentleman, of March 3d, p. 1, 138.)

IV.—Vermont.

Albert Breese, Hubbardton, one bushel, 1857.

1. " *Black Diamond.*—A few diseased, yield not large, good quality. 1858: Nearly hardy.

2. *Garnet Chili.*—Yield large, most valuable potato I know of. In 1858, the most valuable variety I am acquainted with. Not more than one or two dozen diseased tubers in fifty bushels, and I know of no variety that will compare with it in hardiness, yield and quality.

3. *Mountain June Pink Eye.*—No disease, but some dwarfed hills, with small yield, which disappoints me. In 1858, hardy, yield not large.

4. *Utica Pink Eye.*—Much diseased, large yield. In 1858, some diseased.

5. *Pale Blush Pink Eye.*—Health and yield very good, very handsome and good.

7. *New Hartford.*—One of the healthiest, yield large, with promise of being valuable. In 1858, yield large but not so good as last year.

Season of 1857, very wet and late. All common sorts diseased. Davis' (Massachusetts) seedling, badly, diseased both in 1857 and '58." Hence I infer that the weather this year was much worse in Vermont than in central New York. GOODRICH.

V.—NEW YORK.

Wm. R. Miller, Marcy, Oneida Co. He had his seed in 1856.

1. " *Black Diamond.*—An excellent potatoe, " king of sorts."

2. *Garnet Chili.*—This he does not notice in the report of 1857. In 1856, he says yield quite large, estimate next to the Black Diamond.

3. *Mountain June Pink Eye.*—Perfect health, large yield, valuable.

7. *New Hartford.*—Good health, large yield, valuable. *All* your sorts are an improvement in potato culture. Season very bad."

T. L. Harrison, Morley, St. Lawrence county, one bushel, 1857.

1. " *Black Diamond.*—Yield large, sound.

2. *Garnet Chili.*—Had four tubers, one-half of two froze, the remainder brought sixty-one pounds of well-ripened, very perfect potatoes.

3. *Mountain June Pink Eye.*—Green till frost, large yield, had a little disease, not well ripened.

4. *Utica Pink Eye.*—Yield large, two tubers gave nineteen pounds, well ripened.

6. *Ovate Peruvian.*—Two tubers gave fifteen pounds, one rotten. Common varieties were early diseased; crop of potatoes very light. Season wet and cold."

Wm. Anderson & Sons, Hawkingsville, (Boonville,) six bushels, 1857. *No minute statement given.*

" Your sorts yielded from twice to twice and a half as much as the common sorts, and were of excellent quality. The vines of the common sorts were killed by disease, by the 20th of August. A very hard season."

Edward Huntington, Rome, Oneida county, two bushels, 1857.

1. " *Black Diamond.*—An excellent potato, a very little disease.

2. *Garnet Chili.*—Health perfect, yields well, very first quality, the best of all potatoes.

3. *Mountain June Pink Eye.*—Health and yield good.

4. *Utica Pink Eye.*—Considerable disease, less valuable than some of the others.

5. *Pale Blush Pink Eye.*—Sound, good yield, good sort.

7. *New Hartford.*—Health perfect, good yield, appears excellent. Yours were the only sorts I planted that did not suffer very badly from the rot. Some of the old sorts failed altogether. In 1858, all the varieties were prosperous, the Garnet Chili taking the lead."

Henry Keeler, South Salem.—Seed got in 1856.

"Cannot report particulars, but would corroborate the report of 1856, in the Journal for December. (See page twenty, where the main sorts had by Mr. Keeler, are reported on very favorably.)

R. S. Reynolds, Corning, Steuben Co., one bushel, 1857.

1. Black Diamond. Rotted badly; don't like them.

2. Garnet Chili. Health good; in yield, cannot be equalled; think they will prove the most valuable potato in the country. In 1858, three and a half bushels gave 125 bushels of the largest and most uniform in size I ever saw.

7. New Hartford. Rotted some; good yield, a little rough. In 1858, good health, and yield (300 bush. to the acre), excellent to bake; grew smooth this year. The other sorts, (3, 4, 5, and 6,) did not do so well.

The Rough Purple Chilis, are hardy, good yielders, excellent for the table; and with the Garnet Chilis, are the best I know of.

Weather of 1857 very bad; considerable disease in all the old varieties, as the Western Reds, Pink Eyes; one half of the latter destroyed, the vines dying six weeks before frost.

Weather of 1858, better, but some disease of the Western Reds."

C. L. Kiersted, Kingston, Ulster Co.—Seed got in 1856.

"Your sorts all did well; vines healthful until ripe; tubers fine and healthy. The old sorts, especially when manured, rotted very badly. I feel incapable of giving you one-half the praise you are entitled to for your ceaseless efforts made to give the country a substitute for diseased potatoes in the real potato itself."

George S. Dana, Utica—two bushels and a half, 1857.

1. "*Black Diamond.*—An excellent sort for my soil, which is a warm loam; no disease.

3. *Mountain June Pink Eye.*—No disease; a very superior sort. (Mr. D. had no other seedlings.) In the same soil I lost all my Early Junes, Kidneys and Carters. The early and late Pink Eyes were hardly worth digging. I planted thirty-five bushels of the ordinary sorts. I shall have less from them than from your two and a half bushels of seed."

Hon. L. R. Lyon, Lyon's Falls, Lewis County—three bushels, 1858.

1. "*Black Diamond.*—Good size.

2. *Garnet Chili.*—One-half bushel yielded eleven and a half; good size, has the preference in yield and hardiness.

3. *Mountain June Pink Eye.*—Gave the largest yield, but had some small ones.

The other sorts not particularly remembered, the minute prepared at digging being lost.

Not much difference in one and two, for the table, and consider both a great acquisition.

Weather the worst ever known; old sorts died early of disease, the tubers half grown and immature."

Francis Rotch, Morris, Otsego County—one peck, 1857.

1. "*Black Diamond.*—A very valuable, healthy sort.

2. *Garnet Chili.*—Large, handsome, admired by all.

3. *Mountain June Pink Eye.*—Did not ripen well; not equal to those above.

4. *Utica Pink Eye.*—Did not keep as well as some others.

5. *Pale Blush Pink Eye.*—A very nice smooth tuber.

6. *Ovate Peruvian.*—A little diseased.

7. *New Hartford.*—Not so valuable as the other sorts. The season very bad, many families without potatoes for the winter."

W. J. Bissel, Waterville, Oneida Co.—seed not got directly from me, 1858.

2. "*Garnet Chili.*—Planted a few in my garden, and found them all that has been claimed for them. Of the six sorts, I have cultivated none that can compare with them in yield. An excellent table sort."

C. G. Hazzletine, Cherry Valley, Otsego Co.—one bushel, 1858.

2. "*Garnet Chili.*—One-half bushel gave twelve bushels, very fine, large; one-fourth of the crop would average one pound each. A splendid sort.

4. *Utica Pink Eye.*—Health good, very fine, quite early.

5. *Pale Blush Pink Eye.*—Ten pounds gave four and a half bushels; very fine, uniform, quite early.

7. *New Hartford.*—Ten pounds gave five bushels, a fair sort, but not equal to the others in appearance.

The *Trout and Mercers*, (old sorts) were affected with disease."

S. Newton Dexter, Whitesborough, Oneida Co.—one-half bushel, 1858.

2. "*Garnet Chili.*—One peck gave nearly six bushels.

7. *New Hartford.*—One peck gave seven bushels. Both sorts large, and sound tubers."

See Mr. Dexter's report in the Journal for Dec., p. 82.

Very numerous verbal reports like the above might be added from many farmers in Oneida county. GOODRICH.

John R. Chapman, Oneida Lake—two bushels, 1858.

2. "*Garnet Chili.*—3. *Mountain June Pink Eye.*—Planted them in a hot dry sand where my common sorts dried up, and some of them came to nothing. Yours were green until dug, Oct. 15th, and had very large tubers. No disease."

H. M. Swift, Dover, Dutchess Co., one bushel, 1858.

1. "*Black Diamond.*—Large yield, very valuable.

2. *Garnet Chili.*—Rather superior in all respects to No. 1.

3. *Mountain June Pink Eye.*—Small yield, poor quality.

4. *Utica Pink Eye.*—Moderate yield; compares well with the old sorts.

5. *Pale Blush Pink Eye.*—Moderate yield; compares well with the old sorts.

7. *New Hartford.*—Yield enormous, (exceeding anything I ever saw), and of excellent quality, and altogether the most valuable variety I have met with.

All healthful. Disease in some localities, but not with us."

VI.—PENNSYLVANIA.

F. W. Noble, Easton, one bushel, 1858.

1. "*Black Diamond.*—Good health, large yield; one of the best known for the table.

2. *Garnet Chili.*—Very good health, large yield; fair table sort, and one of the most beautiful I ever saw. Ten pounds gave four bushels.

3. *Mountain June Pink Eye.*—Good health; matured late; not large yield.

4. *Utica Pink Eye.*—Health good; yield large; a fair sort.

5. *Pale Blush Pink Eye.*—Good health; moderate yield; fair size; excellent table sort.

7. *New Hartford.*—Health good; yield enormous; cannot be surpassed for a crop, good late sort. *Rough Purple Chili* (coming

from you originally), I procured from Pittsburg. Health good; yield enormous. No disease of any sort."

VII.—Maryland.

P. Donahoe, Bear's Cove, Cumberland Co., one bushel, 1858.

1. "*Black Diamond.*—Health very good; yield not large.

2. *Garnet Chili.*—Health good; 30 lbs. gave 400 lbs..

3. *Mountain June Pink Eye.*—Health good; yield small.

5. *Pale Blush Pink Eye.*—Health good; yield small.

7. *New Hartford*—Health good, yield large. I am particularly pleased with numbers two and seven. Season very unpropitious."

VIII.—Ohio.

J. H. Klippart, Corresponding Secretary Ohio Agricultural Society, Columbus, one bushel, 1857.

1. "*Black Diamond.*—Health and yield, both good.

2. *Garnet Chili.*—Health and yield, both good.

3. *Mountain June Pink Eye.*—This is the sort eminently fit for this region, and "astonished the natives" with its firm, huge, erect stems and vigorous growth; its tubers all large.

7. *New Hartford.*—This is much admired here as a vigorous healthy grower.

Numbers four, five and six were healthful, but much less conspicuous than the above."

Nothing is said of the general character of the season.

IX.—Michigan.

J. C. Holmes, Corresponding Secretary Michigan Agricultural Society, one bushel, 1857, *report on* 1858.

1. *Black Diamond.*—Very hardy, healthful, dry, though watery when dug in the fall.

2. *Garnet Chili.*—Very handsome, good shape, and yield very hardy, but with a hard core in the center when boiled.

3. *Mountain June Pink Eye.*—Health, size and yield, good.

4. *Utica Pink Eye.*—Healthy, yield well.

5. *Pale Blush Pink Eye.*—Handsome, hardy, yield well.

6. *Ovate Peruvian.*—Don't like shape or health.

7. *New Hartford.*—A little knotty, but healthy, yields well and is an excellent variety.

Have seen but one instance of disease this year and that in connection with bad culture."

Mr. H.'s report on 1857, referred only to the table quality of these varieties. The most of them were pronounced from good to very good.

X.—Indiana.

Timothy Brown, Knightstown, one half bushel, 1857.

1. "*Black Diamond.*—This is very dry and farinaceous, but small.

2. *Garnet Chili* and No. 7, *New Hartford* yield the largest, and are a valuable acquisition to our gardeners. The other sorts compare favorably with our old varieties.

This climate is too dry and hot for any potatoes to do well. The last was the best season of many for potatoes. Never much troubled here with disease."

D. D. Cathcart, Bristol, Elkhart county, one peck, 1858.

1. "*Black Diamond.*—Healthy, moderate yield, excellent for table. This and all black sorts tried here become knotty.

2. *Garnet Chili.*—Excellent yield, very large, twelve tubers gave two bushels. Poor for the table, being watery, though to the eye the finest potato I ever saw.

3. *Mountain June Pink Eye.*—Good health, moderate yield, excellent for the table, some dwarfed vines.

4. *Utica Pink Eye.*—Health good, excellent early sort, and a great improvement on the old Mountain June; a decided acquisition.

5. *Pale Blush Pink Eye.*—Eight tubers gave one and one-half bushels; on the whole, the best sort in the whole lot.

7. *New Hartford.*—Good health, poor yield, knotty tubers, some diseased, cook badly.

This season (1858,) was the wettest ever known here. The latter part of it was favorable for potatoes; wet until the middle of July."

XI.—Illinois.

H. A. Maxwell, Canton, one peck, 1857. *No particular statements given.*

"We were pleased with your varieties, though the Mountain June Pink Eye, from some cause, did not do well. The Rough Purple Chili, which you sent me in 1855, gave me this year 180 bushels on eighty-seven rods. This variety stands in high estimation here. Season unfavorable, being dry in the early and much cold rain in the latter part of it."

S. Francis, Springfield, Corresponding Secretary Agricultural Society of Illinois, one bushel, 1857.

1. "*Black Diamond.*—Good yield, very early, healthy, can't be equalled as an early sort; well adapted to this climate.

2. *Garnet Chili.*—Good health and yield, for a late potato can't be beat; fourteen pounds produced six and one-half bushels, all of good size and fair.

3. *Mountain June Pink Eye.*—Poor health, moderate yield; don't approve of it for this country.

4. *Utica Pink Eye.*—Good health and yield; fourth rate.

5. *Pale Blush Pink Eye.*—Good health and yield; fourth rate.

6. *Ovate Peruvian.*—Good health and yield; fourth rate.

7. *New Hartford.*—Good size, well calculated for winter use."

This report is given through two farmers. Mr. F. adds that he thinks the soil too rich where they were planted. Nothing said of the weather.

XII.—Canada West.

George Buckland, Corresponding Secretary Agricultural Society, Toronto, four bushels, 1858.

Mr. B. mislaid his regular report and merely says: "I got some very fine tubers from most of your sorts. The most of them have been distributed to enterprising farmers who will try them in different soils and report their experience."

F. F. Cogswell, Thamesford, one peck, 1857.

1. "*Black Diamond.*—Yield large, valuable.

2. *Garnet Chili.*—Yield large, valuable.

3. *Mountain June Pink Eye.*—Large yield, not very dry, to cook.

4. *Utica Pink Eye.*—Yield large, valuable.

5. *Pale Blush Pink Eye.*—Moderate yield, good.

6. *Ovate Peruvian.*—Moderate yield, good.

7. *New Hartford.*—Large yield, good.

Health of all, good; grew in rich clay loam; almost constant rains through the summer.

GENERAL RESULTS.

Here we have the result of the cultivation of seven varieties of seedling potatoes in twelve (including Canada West,) States. The culture of my imported variety, the Rough Purple Chili, is also frequently noticed. The following seems to be the general results:

1. The Black Diamond is almost always healthful, a good yielder, and usually a good, and often a superior table potatoe. What is most remarkable is that, while here at home, it has always matured latish, it is often early at the west, thus showing, that in its removal there, it is affected as some fruits are.

2. The *Garnet Chili.*—This variety, in health, yield, and appearance, holds a distinguished preëminence, not only among

these seedlings but among all other sorts. Occasionally it is pronounced watery for the table, but it should be remembered that it is one of the youngest of the whole list.

3. The *Mountain June Pink Eye*, though still in many places sustaining its early reputation as "an enormous bearer," is often reported as dwarf in vine, and small in tuber, and thus unsatisfactory. This is becoming true of its culture at home. Everywhere nearly it is reported free from disease.

4. The *Utica Pink Eye* usually yields well, and is a good table sort, but is only moderately hardy in circumstances of prevalent disease. This accords with its home indications, and the statement of my sale bill.

5. The *Pale Blush Pink Eye* usually yields well, and is an excellent table sort, being my oldest seedling given out. Home culture proves it to be moderately hardy, (though superior to No. 4 in this respect). Its culture abroad fully confirms its home character, and justifies its published character of *moderately* hardy.

6. The *Ovate Peruvian*, the true sort at home, has great beauty. Some few have been given out that seem not to have been genuine. Hence it is occasionally reported rough. Its health, at home and abroad, is moderate, as it is published to be. But few have been given out, and hence it is frequently not noticed in the foregoing report.

7. The *New Hartford* is always a large yielder at home, and abroad is often characterized as enormous, taking the lead of all the others. At home, and as described, it is often a little knotty. Such is its charecter abroad. Its home character for moderate health, is, on the whole, more than sustained abroad, as is its character as a good table variety.

8. The *Rough Purple Chili*, which I imported from South America, though too deep eyed, knotty, and often hollow hearted, seems almost everywhere to justify its early recommendation for large yield, great hardiness, and excellent table quality. In that severe year for potato culture, (1857), it was often here, in central New York, almost the only dependence for the winter supply of this vegetable. There is, perhaps, no potato in our country more widely circulated than this.

REMARKS.

1. The judgments recorded in the above digest being passed by cultivators differing widely in taste, may not always be just, being often too flattering, and sometimes the reverse. Yet may it not be deemed a little remarkable, that in a year of so widely preva-

lent and severe disease as was experienced in 1857, eight varieties of potatoes should have been found so uniformly healthful, and otherwise satisfactory, as these were, and more especially as the Black Diamond, Garnet Chili, Pale Blush Pink Eye, New Hartford and Rough Purple Chili, are reported to have been.

2. In all cases of diseased manifestations, these varieties, especially those published as most hardy, showed a distinguished superiority to the old varieties cultivated beside them; equally were they superior in health to the new Massachusetts (Davis') seedling.

3. The great point of interest in the foregoing digest, relates not so much to the *intrinsic character and value of any one, or of all these sorts*, as to the question, *Can the languishing potato crop be benefited, nay, restored, to pristine health, table quality and yield, by the process of reproduction from the seed ball?* These reports are gathered from a wide extent of country, exhibiting a great diversity of soil, exposition and climate; and yet in such a year as 1857, the most of these new sorts were a decided and undoubted success, and seem to answer this question in one long drawn, wide spreading affirmative.

4. One of the most frequent objections encountered in the diffusion of new seedlings, is their inferiority to the old sorts in table quality. Many persons who have suffered severely by disease, are perfectly dissatisfied with a new sort of the greatest hardiness, largest yield, and finest appearance, *because it has not yet attained the highest qualities for the table.* They seem not to be able to comprehend the great law of potato culture, *that qualities for the table are slowly attained*, more especially in sorts of medium or late maturity.

5. With the exception of the Garnet Chili, many varieties of my seedlings originated in 1856, and shown at the late winter fair at Albany, present *a higher assemblage of rare qualities* than those more particularly contemplated in this digest of reports. I refer to such qualities as *color*, (both of skin and flesh,) *shape, position in the soil*, (as neither sinking deep, spreading widely, nor rising out of the ground,) *yield early*, or *medium maturity*, and, chief of all, *hardiness.*

These advantages, now apparently permanently secured, are the result of the choice of better bases from which to choose seed balls; bases in all cases developed among my own seedlings, and which could not well have been found at an earlier period; and bases which, perhaps, no where else exist, except as these older seedlings of mine, or others like them, have been spread abroad.

C. E. Goodrich.

WINTER FRUIT.

REPORT OF COMMITTEE.

The Committee on Winter Fruits beg leave to report that they have carefully examined the samples of apples and grapes entered for competition, and have agreed upon the following award of Premiums:—

Best 20 varieties of apples, John W. Bailey, Plattsburgh, ... Dip and $4 00

Best 10 varieties of apples, W. P. Ottley, Phelps, Ontario county, ... Dip. and $3 00

Second best 10 varieties of apples, W. Ives, Watertown, Jefferson county, ... Barry and $1 00

Third best 10 varieties of apples, J. M. Mattison, Jacksonville, Tompkins county, ... Transactions.

Best plate of apples, (Baldwin,) W. P. Ottley, Phelps, ... S. S. Medal.

Second best plate of apples, J. M. Mattison, Jacksonville, Tompkins county, ... Thomas.

Best sample of grapes, (Isabella,) R. P. Wiles, Albany, ... S. Medal.

Best seedling apple, (recommended for further trial) called "Scribner Spitzenburgh," John W. Bailey, Silver Medal.

The "Scribner Spitzenburgh," exhibited by J. W. Bailey, of Plattsburgh, has characteristics which commend it to the favorable notice of nurserymen and fruit-growers. Its general appearance shows it to be a seedling of the Esopus Spitzenburgh, crossed, perhaps, with the autumn Strawberry, which it resembles in shape. Its color is a deep, lively blush. Its flavor and texture are quite equal to those of its supposed parent.

If the Scribner Spitzenburgh should be as prolific a bearer, and as hardy as the Baldwin, it may prove a valuable acquisition to our fruit list.

Mr. Bailey will render a good service, by reporting all the facts in his possession respecting this new variety. Before it can be put upon the Society's list of first-class apples, full information must be had, as to its origin, and hardiness; its productiveness, its quality for keeping; its adaptiveness to different soils and localities. EDWARD NORTH, D. H. COCHRAN, LYMAN R. LYON, *Committee.*

STATEMENT OF PREMIUM CROPS AT WINTER MEETING, FEBRUARY, 1859.

INDIAN CORN.

C. L. Kiersted, Kingston, Ulster Co.—92 bushels 49 lbs. per acre.

ULSTER COUNTY, ss:

Walter A. Cockburn, being duly sworn, says he is a surveyor; that he surveyed with chain and compass the land upon which C. L. Kiersted raised a crop of corn the past season, and that the land was in one contiguous piece, and the quantity is two acres, and no more.

WALTER A. COCKBURN.

Sworn to before me, this 7th day of December, 1858.

D. S. DECKER, *Justice of the Peace.*

ULSTER COUNTY, ss:

C. L. Kiersted, being duly sworn, says that he raised a crop of corn the past season upon the land surveyed by Walter A. Cockburn, and that the quantity of grain raised thereon was 185¾ bushels, measured in a sealed half bushel, and that he was assisted in harvesting and measuring said crop by Bernard McDermott, and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expense, &c., is in all respects true to the best of his knowledge and belief, and that the sample of grain exhibited is a fair average sample of the whole crop.

C. L. KIERSTED.

Sworn to before me, this 23d day of December, 1858.

D. S. DECKER, *Justice of the Peace*

ULSTER COUNTY, ss:

Bernard McDermott, being duly sworn, says that he assisted C. L. Kiersted in harvesting, getting out, and measuring his crop of corn referred to in the above affidavits, and that the quantity of grain was 185¾ bushels, as stated in the affidavit of C. L. Kiersted.

BERNARD McDERMOTT.

Sworn to before me, this 23d day of December, 1858.

D. S. DECKER, *Justice of the Peace.*

1. The land was water grass sward; had been pastured for some years.

2. I plowed it in the fall, flat furrow, about twelve inches wide, from six to seven inches deep; dragged in the spring until it was mellow; marked the land for planting, both ways, two feet nine inches each way, about three-fourths of the piece. I put a small

handful of rotten horse manure in a hill; dropped from five to eight kernels of small Canada corn in each hill beside the manure; covered it light from the 21st to the 24th of May. The corn appeared above the ground in six and eight days; used about ten quarts seed to the acre. The field contained about seven acres. It was all managed in the same way, and I could perceive no difference in the yield; one part of the lot was as good as the other, except where I manured it in the hill; but where I put the manure, the corn was all of one-third better.

Soon as the corn was up nice, I started a cultivator—went one way, then the other; then hoed the first time; the next week started the plow—went twice in a row each way; hoed again; flat hills. Cut up the corn September 20th; the corn all sound; had about three tons of stalks to the acre, worth $4 per ton. On the 21st and 22d of December I shelled from the cob 185¾ bushels, measure, weighing fifty-seven lbs. to the bushel. The corn I have sold for six shillings per bushel, at Kingston.

Expenses.

To use of land, interest on $100 per acre,	$14 00
2 days' plowing,	4 00
one-half day harrowing,	1 00
marking,	1 00
manuring and planting,	3 00
3 loads manure, at $1.00,	3 00
cultivating three days, at $1.25,	3 75
hoeing six days, at 50c,	3 00
cutting up corn four days, at 50c.,	2 00
husking at 6c. per bushel,	11 14
	$45 89
	Cr.
By 185¾ bushels corn at 75c.,	$139 30
six tons stalks at, $4.00,	24 00
	$163 30
	45 89
In favor of land,	$117 41

The land was swamp. I ditched it thoroughly, some three feet deep.

C. L. KIERSTED.

B. S. Carpenter, Chemung county—80 bushels 26½ lbs. per acre—2nd premium.

The land from which the crop of corn was raised, which I enter for a premium, was in one contiguous piece, and was a part of 8½ acres; which whole piece produced at husking 1,386 bushels of ears of corn, by my usual mode of cultivation. Indeed, I did not intend to enter it for a premium till near the close of the season.

The ground is intervale, and was meadow previous to 1857. In the spring of 1857, it was plowed and planted to corn, which was killed by the overflowing of the river; and afterwards sown to millet. Last spring the millet stubble was plowed in lap furrows, eleven inches wide, and eight inches deep; no manure of any kind was used.

The dragging was done, first, lengthwise of the furrow, and then diagonally, marked three feet apart, each way; and planted in hills, on the 22d and 24th days of May. Corn appeared above ground in about one week. Five and six kernels were dropped in a hill, and only four plants left to grow. The variety of corn was the eight-rowed yellow, and required one quarter bushel per acre of seed.

The corn was cultivated both ways of the rows, with a one horse cultivator twice; first time once in a row, and the second time twice.

The corn on the two acres was cut at the ground, Sept. 22d and 23d. There were 728 bundles of stalks, worth three cents each, and eight loads of pumpkins, (a wagon box holding fifty bushels of corn in ear,) worth one dollar a load. The corn was thrashed, one-half January 21st, the other January 31st, and cleaned February 1st, and measured in a sealed half bushel; and the number of bushels from the two acres was 160$\frac{53}{56}$ bushels. A measured bushel weighed 57½ lbs.

Not having worked on the two acre piece in distinction from the whole field, in cutting up, I have given the labor account below from the proportion that that piece bears to the whole field as the whole labor does to that required on the two acres.

I subjoin the whole account of labor done on the field up to the time of cutting the corn.

1858.		*Dr.*	
May 11.	To 6	days plowing with horse team, at...20s	$15 00
23.	2	days harrowing do at...20s	5 00
24.	1½	days marking with one horse, at....10s	1 88
May 22 & 24.	7	days planting, (men dropping for themselves,) at..... 7s	6 12

1858.				*Dr.*
June 16 & 17.	2 days cultivating corn, at		10s	2 50
22.	4 days do		10s	5 00
June 26.	14½ days hoeing corn, at		7s	12 69
July 6.	4 days cultivating corn, at		10s	5 00
7.	7 days hoeing corn, at		7s	6 13
	Expenses apportioned,			$15 82
Sept. 23.	4 days work cutting, at		7s	3 50
Oct. 19.	To husking and cribbing 356 bu. ears corn, at 3c			10 68
25.	1 day drawing stalks, 2 men & team, at 24s			3 00
	½ bushel seed corn, at		8s	50
	Interest on two acres of land, at		$75	10 50
				$44 00
	1½ days with team, at 16s; and 4½ days man drawing, cleaning and thrashing at 6s,			6 25
1859	*Cr.*			$50 25
Feb. 4.	160 5/56 bushels, at 6s,		$120 66	
	728 bundles of stalks, at 3c,		21 84	
	8 loads of pumpkins, at 8s,		8 00	
				150 50
	Clear profit from the two acres,			$100 25

Luther L. Barney, being duly sworn, says he is a surveyor; that he surveyed with a chain the land on which B. S. Carpenter raised a crop of corn the past season, and that the land was in one contiguous piece, and the quantity is two acres and no more.

L. L. BARNEY.

Sworn before me, February 4th, 1859.

T. S. SPAULDING, *Justice of the Peace, Chemung county.*

B. S. Carpenter, being duly sworn, says that he raised a crop of corn the past season, upon the land surveyed by L. L. Barney; and that the quantity of grain raised thereon, was 160 5/56 bushels, measured in a sealed half bushel; and that he was assisted in harvesting and measuring said crop, by M. W. Jenkins; and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, &c., is in all respects true, to the best of his knowledge and belief; and that the sample of grain exhibited is a fair average of the whole crop.

B. S. CARPENTER.

Sworn before me, February 4th, 1859.

T. S. SPAULDING, *Justice of the Peace, Chemung county.*

Miles W. Jenkins, being duly sworn, says that he assisted B. S. Carpenter in harvesting, getting out and weighing his crop of corn, referred to in the above affidavits; and that the quantity of grain was $160\frac{53}{56}$ bushels, as stated in the affidavit of B. S. Carpenter.

M. W. JENKINS.

Sworn before me, February 4th, 1859.

T. S. SPAULDING, *Justice of the Peace, Chemung county.*

P. S.—The sample of corn accompanying this statement, was taken from the bin after it was all put up, and is a perfect sample of the whole.

B. S. CARPENTER.

Shrinkage of corn in the ear, from the time it is put up, on husking, until it is prepared for thrashing, and binning for market.

Mr. Carpenter is entitled to much credit for his experiment with his corn crop, to ascertain the amount of shrinkage which occurs, from time of cutting up, until it is ready for thrashing.

Fourteen and one-half per cent, was the shrinkage in this case, which was probable more than most farmers would have expected.

There is one fact of some practical importance, ascertained by my experiment with this crop of corn. To ascertain which, I left the thrashing just as long as I could, and present the crop at this meeting.

The fact to be ascertained was, how much a given quantity of corn in the ear, put up at a proper time for husking, will shrink up to a proper time for thrashing and binning.

You will observe that at husking there were 356 bushels, and at thrashing there were but 302 bushels, measured in the same way, and in the same basket, showing a falling off of $14\frac{1}{2}$ per cent.

The season, in our locality, was a peculiar one. There was a severe drouth just at a time to prevent the corn from perfecting the ear at the small end, so that there is not quite as much shelled corn to the cob as usual, which would affect the rule as a general one, somewhat.

The corn was stored in a crib four and a half feet wide, and inside of a building, so that but one side had the sweep of the winds; and it kept perfectly.

The opinion that corn would shrink in the crib to fifteen per cent, when put up properly, was received by many practical farmers with surprise, at the agricultural discussions at Syracuse, last fall. And, in consequence, I was very particular to ascertain the fact. In my labor account, I have placed the highest extreme

of day labor, both for teams and men. But my expenses were much below the figures; (from one-third to one-half,) for I had the work done by my own teams, and men hired by the month, at much lower rates than charged. Respectfully,

B. S. CARPENTER.

OATS.

C. L. Kiersted, Kingston, Ulster Co.—100 bushels 23½ lbs. per acre—1st premium.

Ulster county, ss:

Walter A. Cockburn being duly sworn, says he is a surveyor; that he surveyed, with chain and compass, the land upon which C. L. Kiersted raised a crop of oats the past season; and that the land was in one contiguous piece; and the quantity is two acres, and no more. WALTER A. COCKBURN.

Sworn to before me, this 7th day of Dec., 1858.

D. S. DECKER, *Justice of the Peace.*

Ulster county, ss:

C. L. Kiersted being duly sworn, says that he raised a crop of oats the past season, upon the land surveyed by Walter A. Cockburn; and that the quantity of grain raised thereon was 230¼ bushels, measured in a sealed half bushel; and that he was assisisted in harvesting and measuring said crop by Bernard McDermott; and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, &c., is in all respects true, to the best of his knowledge and belief; and that the sample of grain exhibited, is a fair average sample of the whole crop. C. L. KIERSTED.

Sworn before me, this 23d day of Dec., 1858.

D. S. DECKER, *Justice of the Peace.*

Ulster county, ss:

Bernard McDermott being duly sworn, says that he assisted C. L. Kiersted in harvesting, getting out and measuring his crop of oats, referred to in the above affidavits; and that the quantity of grain was 230¼ bushels, as stated in the affidavit of C. L. Kiersted.

BERNARD McDERMOTT.

Sworn to before me, this 23d day of Dec., 1858.

D. S. DECKER, *Justice of the Peace.*

Previous crop, corn; manured the year previous on the corn; sward plowed, and the manure spread, about twelve loads to the acre; the soil loam, in good condition; located in Ulster county,

no manure on the oats; sowed four bushels to the acre on the 12th April, the common oats sowed in the usual way, by hand; harrowed until the ground was well pulverized; harvested the crop and thrashed and cleaned it from 7th to 10th August. The yield, by measure, was 230¼ bushels; weight, 6,447 lbs., making twenty-eight pounds to the bushel; thirty-two pounds would make 201$\frac{15}{32}$ bushels. I sold them for forty-eight cents per bushel, at Kingston.

	Dr.
To 1½ day's plowing,	$3 00
8 bushels seed, 4s,	4 00
½ days' harrowing,	1 00
3 days' cutting,	3 00
thrashing, &c., 4c. per bushel,	9 21
interest on land, at $100 per acre, 7 per cent,	14 00
	$34 21
	Cr.
By 230¼ bushels, at 48c.,	$110 54
12 loads straw, 24s,	36 00
	$146 54
Expenses deducted,	34 21
In favor of crop,	$112 33

The lot contained twelve acres, of which the two acres are a part. It was all done in the same way.

C. L. KIERSTED.

RYE.

C. L. Kiersted, Kingston. Ulster Co.—forty bushels 25 lbs. per acre—1st Premium.

Ulster county, ss:

Walter A. Cockburn being duly sworn, says that he is a surveyor; that he surveyed, with chain and compass, the land upon which C. L. Kiersted raised a crop of rye, the past season; and that the land was in one contiguous piece; and the quantity is two acres and thirty rods, and no more.

WALTER A. COCKBURN.

Sworn before me, this 7th day of Dec., 1858.

D. S. Decker, *Justice of the Peace.*

Ulster county, ss:

C. L. Kiersted being duly sworn, says that he raised a crop of rye, the past season, upon the land surveyed by Walter A. Cock-

burn; and that the quantity of grain raised thereon was $89\frac{1}{32}$ bushels, measured in a sealed half bushel; and that he was assisted in harvesting and measuring said crop by Bernard McDermott; and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, &c., is in all respects true, to the best of his knowledge and belief; and that the sample of grain exhibited is a fair average sample of the whole crop.

C. L. KIERSTED.

Sworn to before me, this 23d day of Dec., 1858.

D. S. DECKER, *Justice of the Peace.*

Ulster county, ss:

Bernard McDermott being duly sworn, says that he assisted C. L. Kiersted in harvesting, getting out and measuring his crop of rye, referred to in the above affidavits; and that the quantity of grain was $89\frac{1}{32}$ bushels, as stated in the affidavit of C. L. Kiersted.

BERNARD McDERMOTT.

Sworn before me, this 23d day of Dec., 1858.

D. S. DECKER, *Justice of the Peace.*

1. Previous crop oats; no manure ever on the land.

2. The kind of soil, sandy loam, very rich; located in Ulster county. The Esopus creek sometimes overflows it.

3. No manure on the crop; sowed two bushels of common rye to the acre.

4. On the 4th of August, 1857, sowed after the ground had been plowed once; harrowed in the usual manner.

Harvested the 10th July. Thrashed and cleaned November; and the actual yield by weight, 4,719 lbs. By measure, $89\frac{1}{32}$ bushels, making $40\frac{25}{32}$ bushels to the acre, or $81\frac{20}{32}$ bushels to two acres. The straw and grain was sold at Kingston.

	Dr.
To two day's plowing,	$4 00
4 bushels rye, 80c.,	3 20
$\frac{1}{2}$ day's harrowing,	1 00
interest on land at $100 per acre,	14 00
harvesting 3 days,	4 00
thrashing, &c., 6d per bushel,	4 90
	$31 10
drawing straw to market,	3 00
The actual cost,	$34 10

	Cr.
By straw sold, 900 bundles at 3c,	$27 00
$81\frac{20}{32}$ bushels rye at 6s,	61 21
	$88 21
	34 10
Net profit,	$54 11

The whole quantity of land, of which the two acres were taken, was about thirteen acres. C. L. KIERSTED.

BARLEY.

Norman Gowdy, Lewis Co.—1st premium, fifty bushels pr acre.

Statement of a crop of barley raised by me the past season; the ground gravelly loam; previous crop of corn, about one half of it manured in the hill with hog and green, stable manure, the other with green, stable and yard manure, making some eighteen or twenty loads last spring; the part manured in the hill, had a light coat of barn-yard manure plowed in. Sowed the first week in May, six bushels of two-rowed barley; cultivated and harrowed thoroughly and rolled; and the yield was 103 bushels, by measure, on $2\frac{15}{100}$ acres, chained by myself and hired man, Archibald Petrie, and reduced to acres by N. B. Sylvester, surveyor. Said Petrie assisted in harvesting, and thrashing, and measuring the grain. The land north of the barn, adjoining the barn and yard, and north on the line of the farm, being northwest of Lowville, three-quarters of a mile; sixty acres in the farm. The barley was thrashed with a two-horse power thrashing machine with cleaner attached, and after cleaned with I. T. Grant's fanning mill, and the sample exhibited, is a fair sample of the whole crop.

Certificate of surveyor as to the quantity of land.

Value of crop 6s,	$77 25
Straw, $3,	3 00
	$80 25
Interest on land,	$7 53
Manure and expenses,	26 00
	33 53
Profit,	$46 72

NORMAN GOWDY,
ARCHIBALD PETRIE.

Sworn to before me this 6th day of Feb., } DANIEL LOUCKS, *Justice of the Peace.*

POTATOES.

Raised by the undersigned, in Walton, Delaware county, N. Y., in 1858—1st premium.

1st. Previously pastured.

2d. The land is the red soil upland.

3d. Twenty-five loads of manure applied broadcast, and mixed with the soil. Seed used, was about twelve bushels of the long pink eyed and orange varieties.

4th. Planted the last of May, in rows two feet and ten inches each way. Plastered at the time of planting, and after the first hoeing. The potatoes were covered with a shovel-plow. The hoe was but little used, except in digging. The cultivation was mostly done with the shovel-plow. Harvested in October, and found to be on one acre and six rods:

Sound potatoes,	225 bushels.	
Unsound,	8	
	233	
233 bushels of potatoes at 3s,		$87 37
Expenses first plowing (day,)	$2 00	
Expenses second plowing,	1 75	
Dragging and marking,	1 50	
Three men and horse, half day, planting,	2 00	
Twelve bushels seed, at 4s per bushel,	6 00	
Plaster,	1 00	
One man and horse, two days, plowing,	3 00	
Three days hoeing,	3 00	
Harvesting,	6 00	
Half value manure,	12 50	
Interest on land, at $30 per acre,	2 18	
		$40 93
Net profit of one acre and six rods,		$46 44

LEVI HANFORD,
HIRAM OLMSTEAD.

Delaware County, ss:

Wm. B. Hanford being duly sworn, says that he measured the land upon which L. Handford and H. Olmstead raised a crop of potatoes the past season, and that the land is a parallelogram in one contiguous piece, and the quantity is $1\frac{6}{160}$ acres, and no more.

WM. B. HANFORD.

Sworn and subscribed before me this 35th day of Dec., 1858.

S. H. WHITE, *Justice of the Peace.*

Delaware County, ss:

Hiram Olmstead being duly sworn, says that he raised a crop of potatoes the past season, upon land surveyed by Wm. B. Hanford, and that the quantity raised thereon was 225 bushels of sound potatoes, and by estimate, there was eight bushels of unsound ones. The best of the unsound only measured—measured in a basket that had been measured with a sealed half bushel—and that he was assisted by James Nichols, in harvesting and measuring, and that the annexed statement is true.

HIRAM OLMSTEAD.

Sworn and subscribed, this 31st day of Dec., 1858, before me.

S. H. WHITE, *Justice of the Peace.*

Delaware County, ss:

James Nichols being duly sworn, says that he assisted H. Olmstead on harvesting the crop of potatoes refered to in the foregoing statement, and that the number of bushels was 225 of sound potatoes, and by estimate, eight bushels of unsound.

JAMES NICHOLS.

Sworn and subscribed, this 22d day of January, 1859, before me.

S. H. WHITE, *Justice of the Peace.*

MANGEL WURTZEL.

Raised on the farm of Thomas Messenger, Great Neck, Queens county, Long Island; season 1858. First premium, 463 bushels thirty-six pounds on one-half acre of land.

This crop of mangel wurtzel was of the "Orange Globe" species. The seed was procured from Skirving, of Liverpool, England, and three pounds to the acre was the quantity used. The land was prepared in the month of April; plowed eight inches deep. The soil was a rich sandy loam, and the previous crop, buckwheat. The drills were two feet from center to center, and the manure—applied direct to drill—was a compost of one-third pond muck, the remainder cow-yard manure, scrapings of yard, and five loads of gas-house lime, well incorporated. One acre was sowed the 3d of May, the balance from 17th to 21st of the same month. The first sowing produced the most thrifty plants and largest roots. The crop was thinned out, leaving plants about nine inches apart, and transplanted where failures occurred, and was harvested in the middle of November. One-half acre was surveyed and marked off; the product was weighed,

and showed a net weight of twenty-seven thousand eight hundred and sixteen pounds to the half acre, or four hundred and sixty-three bushels and thirty-six pounds, proving a yield of nine hundred and twenty-seven bushels and twelve pounds to the acre, allowing to the bushel sixty pounds. Some of the largest roots weighed fifteen pounds.

The expense of cultivating this crop is less than that of most other roots, from the fact of the leaves spreading rapidly, thus keeping down weeds which so accumulate to the great disadvantage of other root crops. This crop is also much more reliable than turnips, not being affected by heat or drought.

The value of the mangel wurtzel for feeding cattle, sheep and swine, I find, after three years' experience, is of the highest utility. For these purposes, the result of my limited experience is, that one acre is more than equal to two acres of corn, taking the average of seasons.

The following is the cost of production:

Plowing two acres of land at $3.75,	$7 50
50 wagon loads compost at $1,	50 00
6 lbs. seed,	1 00
Sowing three days at $1,	3 00
Cultivator three days at $1.50,	4 50
15 days labor at $1,	15 00
4 men transplanting, three-quarters day, at $1,	3 00
Harvesting, five men two days at $1,	10 00
Land, value $150 per acre, interest 7 per cent,	21 00
	$115 00
$1854\frac{24}{60}$ bushels mangels at $12\frac{1}{2}$ cts.,	$231 80
Value of tops for feeding cattle, &c.,	10 00
	$241 80
Cost of production,	$115 00
	$126 80

Thus showing over one hundred per cent profit, putting the roots at an extremely low figure.

THOMAS MESSENGER.

December 13, 1858.

QUEENS COUNTY, } *ss:*
Town of North Hempstead, }

I, Singleton L. Mitchell, of the town of North Hempstead, in

the county of Queens, do solemnly declare and affirm, that I am a practicing surveyor, that on the eighth day of November, eighteen hundred and fifty-eight, I measured eighty square rods of ground for Thomas Messenger, of the said town of North Hempstead, upon which mangel wurtzel beets were then growing.

SINGLETON L. MITCHELL.

Subscribed and affirmed before me this 8th day of November, 1858.

LEONARD A. SEAMAN, *Justice of the Peace.*

CITY AND COUNTY OF NEW YORK:

I, John F. Messenger, of the city of Brooklyn, county of Kings, do solemnly declare and affirm, that at the request of Thomas Messenger, Esq., I did weigh the mangel wurtzel, raised on one-half acre of ground, measured by Singleton L. Mitchell, surveyor, from the crop grown by said Thomas L. Messenger, on Great Neck, County of Queens, town of North Hempstead, and that the result was *twenty-seven thousand, eight hundred and sixteen pounds*, or *four hundred and sixty-three bushels and thirty-six pounds.*

JOHN F. MESSENGER.

Sworn before me, November 30, 1858.

H. C. BANKS, *Commissioner of Deeds.*

PEAS.

Ira R. Peck, East Bloomfield, 1st premium—thirty-nine and a half bushels on one and one-tenth acres.

1. The field upon which this crop was grown, contains eight acres, and has been in clover pasture the three last previous years. Five acres of said field were sowed to peas, and no manure of any kind used.

2. Soil a deep, mellow, gravelly loam, in the ordinary state of fertility. Farm located near the village of East Bloomfield, Ontario county.

3. No manure was applied to this crop. Three bushels of seed (the "Canada Field Pea") were used on the piece referred to in the accompanying affidavit.

4. Sowed broadcast by hand on the 14th day of April; harvested with horse rake on the 17th day of August, and drawn in and thrashed out with horses, and cleaned and measured on the 21st and 22d of August—there being thirty-nine and a half bushels, by measure, weighing fully sixty pounds to the bushel. Market price, seventy-five cents per bushel, home market.

5. Expense of cultivation.

One day plowing, with two horses	$2 00
Three bushels seed, at 75c.,	2 25
Sowing, harrowing and rolling,	1 75
Raking and drawing,	2 00
Thrashing and cleaning,	3 00
	$11 00

	Cr.
Value of crop,	$29 62
Expenses,	11 00
Profit, exclusive of interest on land	$18 62

IRA R. PECK.

EAST BLOOMFIELD, *January 3*, 1859.

Ontario county, ss:

Amos Brunson, being duly sworn, says he is a surveyor; that he surveyed with chain and compass a piece of land upon which Ira R. Peck raised a crop of peas the past season, and that the land was in one contiguous piece, and the quantity is one and one-tenth acres, and no more.

AMOS BRUNSON, *Surveyor.*

Sworn to before me, this 3d day of January, 1859.

JOSIAH PESTER, *Justice of the Peace in and for said county.*

Ontario county, ss:

Ira R. Peck, being duly sworn, says that he raised the past season a crop of peas upon the land surveyed by Amos Brunson, and that the quantity of grain raised thereon was thirty-nine and one-half bushels, measured in a sealed half bushel, and that he was assisted in harvesting and measuring said crop by John Mason, and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expense, &c., is in all respects true, to the best of his knowledge and belief, and that the sample of grain exhibited is a fair average sample of the whole crop.

IRA R. PECK.

Sworn to before me, this 3d day of January, 1859.

JOSIAH PESTER, *Justice of the Peace in and for said county.*

Ontario county, ss:

John Mason, being duly sworn, says that he assisted Ira R. Peck in harvesting, getting out, and measuring his crop of peas, referred

to in the above affidavits, and that the quantity was thirty-nine and one-half bushels, as stated in the affidavit of Ira R. Peck.

JOHN MASON.

Sworn to before me, this 29th day of January, 1859.

R. C. STILES, *Justice of the Peace.*

BEANS.

Solomon Walrath, Canton, $\frac{29}{100}$ of an acre, at the rate of sixty bushels per acre—a special premium recommended for the manner of preparing, and cultivating the land and the crops, thus securing a very large yield.

St. Lawrence county, ss:

Henry Thompson, being duly sworn, says he is a surveyor; that he surveyed with chain and compass the land upon which Solomon Walrath raised a crop of beans the past season, and that the land was in one contiguous piece, and the quantity is $\frac{29}{100}$ acres, and no more.

HENRY THOMPSON, *Surveyor.*

Sworn to before me, this 7th day of January, 1859.

C. VAN WATERS, *Justice of the Peace.*

St. Lawrence county, ss:

Solomon Walrath, being duly sworn, says that he raised a crop of beans the past season upon the land surveyed by Henry Thompson, and that the quantity of grain raised thereon was 910 pounds, as weighed by standing weights, and that he was assisted in harvesting and weighing said crop by Henry S. Walrath, and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expense, &c., is in all respects true, to the best of his knowledge and belief, and that the sample of beans exhibited is a fair average sample of the whole crop.

SOLOMON WALRATH.

Sworn to before me, this 7th day of January, 1859.

C. VAN WATERS, *Justice of the Peace.*

St. Lawrence county, ss:

Henry S. Walrath, being duly sworn, says that he assisted Solomon Walrath in harvesting, getting out, and weighing his crop of beans, referred to in the foregoing affidavits, and that the quantity of beans was nine hundred and ten pounds, as stated in the affidavit of Solomon Walrath.

HENRY S. WALRATH.

Sworn to before me, this 7th day of January, 1859.

C. VAN WATERS, *Justice of the Peace.*

The quantity of land appropriated was $\frac{29}{100}$ of an acre; quantity of beans raised was 910 pounds. Hops were raised on the foregoing land for the past two previous years, and top-dressed with compost. The condition of the land the same as that upon which my corn was planted, i. e., it has been cropped for eighteen years past without seeding. The land is located in Canton, St. Lawrence county, and State of New York. Planted one-half bushel; the small pea bean; planted the last of May, in drills eighteen inches apart between the rows; harvested them the last week in August; harvested by pulling them from the ground, and placing the roots up, and when half cured, turned them over, and when dried, placed them in the barn; thrashed and cleaned in November. Market value, $1.25 per bushel, and straw valued at $1.00; sold at my house. Expense attending this crop as follows:

Team one-fourth of a day, at $2, myself five days at 75c.,	$4 25
Interest on land, 88c., seed 63c.,	1 51
Total,	$5 76

EXPERIMENTS WITH INDIAN CORN.

VERONA, ONEIDA COUNTY, N. Y., *Jan.* 1, 1859.

I have examined the different ways pointed out for experimenting on raising corn; I have tried a way different from any of those pointed out. The land I cultivated for corn was gravelly soil, with some loam; it had been to grass some five years without any manure during the time. I plowed it about the first of May from five to six inches deep and all turned over. Before plowing it, I put on to a little over two acres, thirty loads of stable manure, mostly coarse, and spread it over the whole piece as even as I could. I then harrowed it well both ways and then marked it both ways with a marker about three and one-half feet apart, I took then about six bushels of hen manure and put about a spoonful in each hill, over the whole piece. From the 10th to the 12th I planted it; the seed was a mixture of the Dutton, King Philip, and Ohio; I covered the hen manure about one inch and then dropped the corn directly over the manure and covered about an inch deep; in about two weeks it was hoed and did well; in about three weeks it was well hoed again. The first time hoeing I pulled up where it needed it, and left standing from four to five stalks, most of the hills four. It was cut up about the 20th of September. The fore part of October it was

husked. I measured off of one side of the piece one-half acre and had a man to help me husk it and another to help measure it. It was measured in two one bushel baskets, either of the baskets held some over a bushel. We measured off of the one-half acre eighty baskets well heaped and shook down. I have since shelled two bushels of the ears and it made one bushel after shelling. The season in this vicinity was very dry about the time the corn was earing, and grasshoppers were very thick indeed; the dry weather and grasshoppers, I think, cut it short from fifteen to twenty bushels. Under the circumstances I think it fair. I think the hen manure made some twenty-five or thirty bushels of corn on the two acres. Below I will give the expense of cultivating the half acre, &c.:

Plowing land,	$1 00
7½ loads manure,	3 50
Spreading manure,	25
Harrowing,	25
Marking,	20
Planting,	50
Hoeing twice,	1 00
Cutting up corn,	50
Husking,	1 75
Carrying to barn,	50
	$9 45
Interest, one-half acre, $37,50,	2 62
	$12 07
	38 00
	$25 93
Cost of hen manure,	40
	$25 53
Cultivating corn twice, 53 cts.,	53
	$25 00

Contra.

40 bushels of corn at 6s.	$30 00
1 load pumpkins,	1 25
Stalks, equal one-half ton of hay,	5 00
Half of manure, $3.50,	1 75
	$38 00

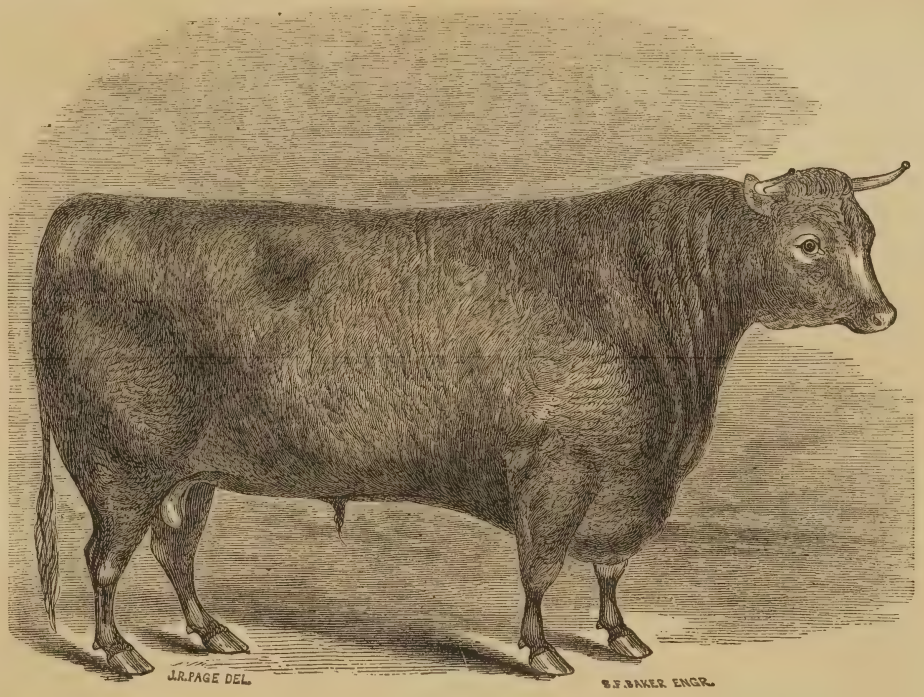
I find after deducting the expense of cultivating and interest on land, and one-half of manure, there is left for profit on the half acre, twenty-five dollars, which I think, under the circumstances, is doing fair.

Weight of Leicester Pigs eight months old.—I will give you the weight of three pigs which I had butchered on the 27th of December last. They were the *Leicester breed*, eight months and twenty-two days old. They had the milk of three cows, well skimmed, and about two quarts of corn meal each day, till September; after that I gave them corn in the ear, about six weeks, then corn meal, all they would eat, till they were butchered.

Weight of Pigs.

One pig,	298 lbs.
One pig,	320
One pig,	340½
	1058½ lbs.

O. W. BLAIR.



EMPIRE.

The property of Joseph Hilton, New Scotland, Albany County, N. Y. Calved March, 1852; sire, the imported bull, Albert, No. (2); grand sire, Baronet, (6); gr. g. sire, Quartly's Prince of Wales, (105); dam Eliza, by Baltimore, (143); g. dam, Fancy, (710); gr. g. dam, Old Fancy, (709). Empire was the winner of the first prize at the New York State Fair at Buffalo, in 1857, as the best Devon Bull, three years old and over; and wa awarded a certificate at the State Fair at Syracuse, 1858, as the best Devon Bull on exhibition.

EXTRACTS FROM REPORTS OF COMMITTEES STATE FAIR, SYRACUSE, 1858.

No. 1. SHORT HORN BULLS.

The committee on Short Horn bulls, beg leave to have it understood, that in their decisions, "quality" was their first consideration; and with the *majority* of the committee, was a very ruling feature in deciding their awards.

ROBERT KIRKWOOD, GEO. MILLER, FRANCIS ROTCH, *Committee.*

DEVON BULLS.

The committee on Devon bulls, report that there were thirty-six bulls on exhibition, very generally of *superior quality.* The best American bred bull, over three years old, was exhibited by Joseph Hilton, of Albany, bull "Empire," and a diploma is awarded him as the best bull. Two imported bulls were exhibited of superior excellence, "Exeter," owned by Edward G. Faile, of West Farms, a noble animal, worthy of high commendation, as well as the first prize—three years old.

The two year old bull, "Hiawatha," although the junior of "Exeter," is destined to secure the renown of his illustrious *predecessor*, and is awarded first prize. Both of the bulls we consider valuable acquisitions to the owners and the stock growers of the Empire State. Much might be said in praise of the American bred animals receiving the premiums, but the several awards intimate that desirable distinction to which we believe them justly entitled. We consider the stock submitted to us, to be of a very superior quality, and have had great difficulty in deciding, on account of the high quality possessed by many of the animals. We recommend a special prize of $5.00, to J. R. Chapman, Oneida lake, for the splendid animal shown by him, "Master Quartley," one year old.

RICHARD COATS, Canada West; E. N. THOMAS, Rose; L. T. MARSHALL; Vernon, *Committee.*

Com. 9. IMPORTED AYSHIRES.

The committee specially commend, as the best cow shown, "Bessie," owned by S. D. Hungerford, of Adams, and award her "the certificate, having previously received the first prize.

A. McARTHUR, ELIJAH BAILEY, *Committee.*

Com. 13. WORKING OXEN.

The committee, in consequence of the superior exhibition of working cattle, have made a class of four years old, and recommend separate premiums to them. They would make honorable mention of a very fine pair of oxen shown by William Hurst, of Albany—one of which was five and the other four years old—but considered too fat to compete as working cattle. The committee respectfully suggest, that hereafter there be a separate class of cattle, from four to five years.

STEPHEN LEGGETT, Henrietta; WM. C. TRACY, Penfield; P. EDWARD VAN ALSTYNE, *Committee.*

14. STEERS—THREE YEARS OLD.

The committee recommend a discretionary premium of silver medal to A. & H. Bowen, jr., Medina, for a pair of Hereford steers, half blood, well broken, and we consider this cross a valuable one for working cattle. To S. D. Baker & Son, Earlville, we recommend Transactions and $2.00, for their Devon grade steers, worthy of commendation; we also recommend to the Society, hereafter to have two classes of steers; the first to be well broke, and the second unbroken.

EDWIN WOOLWORTH, Turin; ELISHA BRIGGS, Johnstown; HARRISON HOPKINS, Auburn, *Committee.*

Com. 16. FAT CATTLE, STALL-FED.

The committee on fat cattle report that the show was of extraordinary merit—superior, in their opinion, to any former display which has come under their notice. They only regret that the number of premiums was too few, even for the animals of remarkable excellence, and are constrained to recommend to the Executive Committee, discretionary premiums to A. Jackson, of Onondaga Castle, a diploma, for two remarkably well fatted four years old steers, weighing 2095 and 2100 pounds each. To Thomas Kimber, Onondaga, a diploma, for two stall-fed oxen, which are not embraced in the premium list, because more than five years old. Their merit is such, that the judges cannot refrain from recommending them for a discretionary premium. To Mason Sals-

EDITH.

The property of Joseph Hilton, New Scotland, Albany Co. Edith, calved Oct. 9, 1848; bred by Earl Leicester, and imported by Col. L. G. Morris, in 1850; sire Barton, bred by Mr. Turner; gr. sire Hundred Guinea (57); dam Emily (158) by Spencer; g. d. Ellen (157) by Quartly; gr. g. d. Evergreen (159), bred by Earl Leicester. "Edith" was awarded first prize at the State Fair at Buffalo, 1857, as the best imported Devon Cow.

bury, Ellisburg, a diploma, for two stall-fed oxen, to which the same remarks as above will apply.

ELLATHAN GAZLEY, JAMES BATTERSBY, WM. R. BOOTH,
Committee.

18. FOREIGN CATTLE.

The committee would highly commend the Hereford bull calf, of Mr. Humphreys, of Ohio, and would generally commend the lot of Herefords shown by him, as animals of very great merit, highly creditable to him as a breeder.

L. G. MORRIS, THOMAS RICHARDSON, C. S. WAINWRIGHT,
Committee.

COM. 21. THOROUH BRED HORSES.

The committee regret that so few thorough bred horses were on exhibition, and those not of a character desired, or which the Society had a right to expect. The committee noticed with pleasure upon the ground, the prize horse "Consternation," whose stock on exhibition, as well as through the county, is his best commendation.

T. S. FAXTON, F. VAN DENBURGH, B. N. HUNTINGTON,
Committee.

REPORT ON JACKS AND MULES.

George O. Blennis, Salina, N. Y.—One grey mare mule, seven years old, about seventeen hands high, and weighs, according to her owner's statement, over 1,400 pounds; but we should not think so much in present condition. We should place this animal in the first rank, but as the Society awards no premium for a single mule, we cannot make it any award.

F. Danforth, Auburn, N. Y.—One yearling horse mule, a good animal, ranking second rate. No premium being awarded by the Society, we make it no award.

James Dimpsey, Canandaigua, N. Y.—One pair of brown mules, two years old; one a horse, the other a mare. We cannot give this pair of mules the first prize, on account of want of size, and would, therefore, recommend a second prize of ten dollars, ($10.)

Daniel Blackman, Washington Mills, N. Y.—One light grey jack, five years old, about twelve and a half hands high. If the Society could award this animal a third prize, we should recommend their doing so; want of size prevents our placing him higher.

E. C. Bliss, Chautauque county, N. Y.—One dark brown jack, four years old, about fourteen and a half hands high, and weighing, we should think, about 900 pounds. This animal is highly

meritorious in his general points and appearance, and were he not blind, we would award him the first prize of twenty dollars; but owing to these defects, we leave the matter to the officers of the Society.

E. C. Bliss, Chautauque county, N. Y.—One dark grey jennet, two years old, thirteen hands high, a fine, nice animal; had she more size, would award her the first prize of twenty dollars; but as she lacks in this, would recommend a second prize of ten dollars. (The Executive Committee made this a first prize of $20.)

The judges of this highly useful class of domestic animals, regret that so few of them were on exhibition; with the long line of canals which we have in this great State, mules of a suitable age, and well broken, would be found much more serviceable for towing boats than horses. They are used almost exclusively for this purpose, on the canals of the State of New Jersey, and are much preferred there to horses, being found, after many years experience, with these two classes of animals, greatly more economical and enduring. We understand that an attempt has been occasionally made in the State of New York, to use mules for towing boats on our canals, and only failed because they took them unbroken, and too young, and trusted their driving and the care of them almost exclusively to *boys*.

Mules are also found in New Jersey, and other States, highly valuable for farm work, and particularly so for road work, in wagons, and on horse railroads; and when sufficiently large and heavy, are very serviceable in city drays and carts.

A. B. Allen, New York; John Munro, jr., Elbridge; Daniel C. Munro, Elbridge, *Committee.*

Syracuse, *Oct.* 5, 1858.

37. SHEEP—SPANISH MERINOES.

The committee on Spanish Merinoes have discharged their duties with much pleasure, and have decided according to the merits of the animals, and have been unanimous in their awards.

The committee regret that so few of this valuable breed were shown; but it is gratifying to be able to say that there were some very fine specimens of the breed; while some were of ordinary character.

Animals of this class do not generally appear as well in pens, at our fairs, as at home, under the care of skillful herdsmen and flockmasters, but much may be done, and should be, to improve their appearance at our shows, by careful attention to the flock.

Jonathan Talcott, Carl Heyne, George Campbell.

Shepherd's Crook.

The committee to whose examination was given a most finished and perfect specimen of the "sheep crook," designed by James Geddes, of Fairmount, Onondaga, report—That for the first time, in the exhibitions of the State Society has such an article came to their notice; and they believe this almost indispensable implement of the "foreign" flock-master and shepherd, so far as their own observation is concerned, as connected with the American farmer is, with few exceptions, associated only with the "picture book" and the "Damon and Phyllis" poetry of the book stores and mantle shelf.

Your committee, however, take the liberty of saying, that with all who keep sheep, no implement is more useful than the "sheep crook" in catching and separating an individual sheep from the flock; nor is there any mode so easy to the shepherd, so safe to the sheep, or so rapid in its work, as in the use of the crook. It costs but a dollar, is the simplest of almost any "tool" in construction; and no owner of a sheep should be without one. The undersigned has had one in use many years, and his own experience warrants him in the remark, that no man can be a complete shepherd without one or more of these articles at hand. Your committee hope that they will hereafter come into universal use with all our flock-masters, and while they gratefully award Mr. Geddes the first class silver medal of your Society, they also express to him their individual thanks, that he has thus brought this highly meritorious implement, so perfect in its kind, to the attention of the public through the auspices of the State Agricultural Society.

In behalf of the Committee.

LEWIS F. ALLEN, *Chairman.*

Syracuse, Oct. 8, 1855.

Com. 47. report on plowing—state fair, syracuse.

To B. P. Johnson, *Secretary N. Y. State Ag. Society:*

The undersigned judges appointed to award the Society's premiums on plowing, beg leave to report,

That on the morning of Friday, the day selected for plowing, we were informed by S. M. Brown, Esq., superintendent of plowing, that the grounds had been selected, surveyed, and a sufficient number of lands marked for the different competitors; and that the arrangements were so far completed that it would be neces-

sary for us to be on the ground by 10 o'clock, A. M., at the appointed time, in company with one of the members of the executive board. We arrived at the ground selected for the occasion, and instead of seeing some half dozen teams; and from fifty to seventy-five men on the ground, (as is too often the case at trials of this kind), we were highly gratified to find that *twenty-three* teams had been entered for competition; and that the large field selected for the occasion was well filled with anxious and eager spectators—and we here take occasion to say that much credit is due to the superintendent of plowing, for the orderly and prompt manner in which all his duties were performed.

Another gratifying feature was that the competition was not confined to those living in the immediate vicinity of the fair. Many of the competitors came large distances, (some of them over fifty miles), to be present and take part in this most useful part of husbandry.

And here your committee would say that very much of the good success of the trial is due to the competitors themselves, for the ready and cheerful manner in which they complied with all of the rules adopted by the committee for their guidance; and it gives us great pleasure to say that on no former occasion have we witnessed such uniformly good work done. Each of the twenty-three competitors, in the judgment of your committee, were entitled to a *first* premium, so well and skillfully was their work done; and could our report end here, it would relieve us from the necessity of applying the rules your Society have adopted for our government, which require us to designate the competitors that are *entitled* to the different premiums offered; and whilst we say that *all* of the competitors did their work remarkably well, and each entitled to a *first* premium, yet the rules above referred to require us to designate the persons *best* entitled to the various premiums offered.

Therefore we award the first premium, of $20, to Charles Worker, of Onondaga county; the second premium, $15, to A. Fay, Jr., Geddes, Onondaga county; the third premium, $10, to A. Lathrop, Geddes, Onondaga county; fourth premium, $5, to D. B. Westfall, Lyons, Wayne county; fifth premium, Transactions, to George P. Thomas, Westmorland, Oneida county. Boys—first premium, $20, to S. D. French, Richfield Spa., Otsego county; second premium, $15, J. A. Nottingham, Syracuse, Onon. county; third premium, $10, to George Brydon, Kirkland, Oneida county; fourth premium, $5, Henry Stevens, Jr., Geddes, Onondaga county;

And further, that each of the other competitors are entitled to a vol. of the Society's Transactions, viz:

John Hayden, plowman; C. W. Eells, Westmorland, Oneida, plowman; Joseph Burden, Onondaga, plowman; George Collins, Watertown; S. Campbell, New York Mills, Oneida; Peter Auld, Utica; G. W. Keeler, Central Square, Oswego; John Christopher, Manlius, plowman; Thomas Wilcox, Fulton, Oswego, plowman; J. B. Noyes, Liverpool; W. E. Pomeroy, Syracuse; Rosson Anderson, Onondaga Valley, plowman; R. M. Hermance, Utica, plowman.

And in conclusion, we beg leave to say that most of your committee have been often present at the Society's plowing matches, and that on no former occasion have we ever witnessed so many *good teams*, *good plows* and good *plowmen*, nor half of the number of spectators, nor one-tenth part of the enthusiasm as on this occasion. All of which is respectfully submitted.

ISAAC FOOTE, JR., Chenango; THOMAS DANFORTH, B. S. CARPENTER, Chemung; SAMUEL B. PIERCE, JOSEPH WATSON, Wayne.

COM. 49.—FARM IMPLEMENTS.

The articles in this class were very full and worthy of commendation, and reflect much credit upon the manufacturers and exhibitors, being superior, as a class, to any former exhibition.

SAMUEL FROST, *Chairman.*

COM. 53. GRAIN AND SEED.

The show of seed corn was very splendid—both white and yellow varieties—twelve and eight-rowed. The samples to which premiums have been awarded, are but little better than those passed by; some Ohio Dent corn, grown in Seneca county, by Joseph Wright, of Waterloo, was quite superior, and very well ripened; a diploma was recommended.

A string of very fine corn, seventy feet in length, all from stalks producing two ears each—by J. Barber, Homer; is recommended for a silver medal.

P. Mattoon, of Vienna, Oneida county, exhibited four varieties of corn, and a beautiful sample of sugar cane seed grown in Illinois.

W. IVES, NATHAN TALCOTT.

COM. 56. BUTTER.

In the first, second and third premiums for adults, there is at this time, as is generally the case, a warm contest; and we think

it would be more just to equalize these premiums another year, as the difference in quality is so small. The samples of John S. Shattuck, were in neat and beautiful kegs, deserving notice. The Welsh tubs, by E. Woolworth, and E. Baldwin, were beautiful specimens of tubs, as well as butter, and it would be well for our packers to remember that handsome, bright packages add much to the value of butter in our great butter mart, New York city; we all know the effect of pleasing the eye.

In the samples of butter exhibited by the girls, we think there is an evident improvement on the matrons; only one sample of the girls' but which would have been considered a prime article.

With the sample made by Miss Mary E. French, Richfield Springs, we found on the top a sack, say one-eighth to one-fourth inches thick, filled with salt covering the package, preventing the salt, when shipping the butter, from getting in contact by rough handling, and keeping the top moist and in fine condition, which the jobber will esteem of much advantage—and we consider it worthy of particular attention.

A. B. King, DeWitt, Onondaga, exhibited what appeared to be a piece of pure salt, found in a gypsum bed in Onondaga county—deserving a special notice—and the first, so far as we understand, of the kind found in the State; it weighs sixteen ounces, and is a very fine specimen; a diploma is recommended. It is also desirable this should be analyzed so as to determine its true character. Hamilton Morrison, Montgomery, Orange county; T. C. Leach, Jefferson county; R. M. Bowne, Glen Cove, Queens county; W. H. Skeels, Jefferson county, *Committee.*

Com. 57. cheese.

The Committee report but one sample of cheese over one year old. This was a very fine sample, weighing eighty-six pounds, and worthy of a premium. Ten samples of new cheese were shown, many of them fine samples, and richly deserving the premiums of the Society. The Committee, however, regret that so large an interest as this in the State, was not much more extensively represented by the dairymen of our State.

Gardner Towne, H. A. Hull, Alonzo Wood, *Committee.*

Com. 61.

The Committe were not able to find a specimen of gentlemen's linen, made by a girl nine years of age, and entered by Mrs. Horace Clark. A very nice piece of cotton and linen diaper, exhibited by Mrs. Chester Clark; and Miss Jane Welling, of Pittstown,

exhibited a very fine piece of linen, for collars and bosoms. The above were well worthy of premiums, and are entitled to very high commendation. A variety of very superior articles were entered by Mrs. Henry Wier, of Pittstown, Rensselaer connty, for which premiums were awarded.

The Committee would further report, that if there were more ladies in the State, of equal public spirit, and with ability to compete with Mrs. Henry Wier, of Pittstown, Rensselaer county, for premiums in this department, there would be more industrious wives than at present.

T. I. Chatfield, Jonathan R. Powell, Henry N. Hubbard,
Committee.

Com. 67. parlor stoves.

The Committee would mention, that J. C. Henderson, of Albany, has on exhibition a new and improved stove, recently patented, and known as the "Albanian," for burning soft or bituminous coal. The more perfect combustion of the smoke and gases of bituminous coal is of the greatest importance—especially so, when the vast amount of this description of fuel, with which the country abounds, is taken into account. The western world is supplied with no other. This improvement seems to meet a very decided want; consuming, effectively and entirely, the smoke and gases emitted (heretofore lost) in the use of soft coal. It seems equally effective in the use of other fuels. This stove has been awarded the highest premium; but this notice is nevertheless deemed due to it.

George F. Gray, John Winslow, Geo. O. Daniels, *Committee.*

Com. 72. discretionary.

To the President and Executive Commitee of New York State Agricultural Society:

Gentlemen—The undersigned, acting members of the "Discretionary Committee" beg leave to report, that in the execution of their duties which proved to be arduous, they have endeavored to keep within the rules prescribed for their action in awarding premiums upon such articles presented for examination as gave evidence of "improvement useful to the farmer," having "valuable properties," "of ingenuity, usefulness and merit," and not otherwise "provided for in the foregoing list of premiums."

We would suggest the propriety of reducing the labor of this committee on future exhibitions, by classifying articles named in

our this year's schedule, and express the opinion that sufficient can there be found, easy of classification, to present sufficient labor for two "standing committees" or "boards of judges," and the residue of *accidentals* constitute a reasonable tax upon the time and patience of a board of discretionary judges.

Among the 410 articles examined by your committee, (the labor of which commanded our entire attention, from the time of the receipt of our schedule until the close of the exhibition), very many truly meritorious have been omitted in our awards, having gone into general use, and are well known and duly appreciated by the public.

Our awards are as follows:

To S. T. Savage, Albany, tile bars for malting purposes, steamboat bars, and three malt tiles, ... Dip.

Dudley and Holmes, Detroit, Michigan, Sunlight Gas Works, ...Dip & Large Med.

These "gas works" are "domestic," portable, easily removed, are of different sizes, and cost different "figures," from $30 to $100, adapted to lighting a single dwelling or our largest hotels or manufactories. Any and "all kinds of grease" can be used in the manufacture of the gas, and the exhibitor claims that a single burner can be supplied, by his process, at a cost of one-sixteenth of a cent per hour, furnishing a light equal to six candles.

Anthony Will, Syracuse, specimen of wax work,.....Small Med.

Dillaye Bros., Syracuse, sample of perfumery, ... Dip.

I. A. Thurber & Son, Syracuse, case of crackers and bread, Trans.

Brower's, Syracuse, keys, castings, whistles, gong bells, &c., Dip.

The exhibitor is entitled to much credit for his efforts to furnish necessary articles for the use of hotel keepers, of which he seems to have a large supply, all evidence of skill in their maker.

Bryant and Stratton, Buffalo, ornamental and business penmanship, ... Dip.

The specimens exhibited were of superior excellence, deserved and received much attention from the lovers of art.

D. & S. P. Geer, Syracuse, Herring's bank safe, ... Dip.

C. Jillson, Worcester, Mass., Jillson's animal trap,..Dip. & Trans.

F. S. Pease, Buffalo, Pease's improved engine, car and lard oil, and refined winter lard,.....Small Med. & Dip.

These specimens gave evidence that they had been "improved," and the manner in which they were "put up" for exhibition was truly tasteful. The specimens were truly meritorious.

A. Bond, Buffalo, anti-friction screw driver,.....P. O. Report.

Stuber & Cratsenburgh, Turin, Lewis county, case harness tools, ... Dip & Trans.

This "case" was virtually a valise or small trunk, standing on one end. The whole could be opened and laid upon a level surface, or suspended upon side of wall in front of seat of workman, and contained a perfect set of tools, ingeniously attached to the inner surface of "case," so that when closed and locked, the "tramping jour." could place it under his arm and pursue his journey, his tools secured against contingencies.

S. Oppenheim, Syracuse, watch, works and case all of wood, made 157 years ago, ... Trans.

This watch could come under our notice, only upon the ground of being a specimen of mechanism evincing "Ingenuity" in its author, who, (if the age of the article be correctly given) must be numbered among "those who were." The award is made to the exhibitor for his efforts to preserve antique specimens, and present them in contrast with the improvements of the age.

J. S. Hoefler, Syracuse, case of confectionary, ... Downing.

Duryea and Forsyth Manufacturing Co., Rochester, bank safe, house or plate safe, and letter copying press, ..S. S. Med. & Dip.

The above exhibition was commendable, and each article its own recommendation; the house safe is desirable in every family.

John Noble, Salina, three salt barrels, ... Pat. O. Rep.

J. T. Johnson, New York, soaps and blueing, ... Dip.

do do shoe and leather polish, ... Trans.

The committe take pleasure in saying that the above named articles were of superior quality and merit; the *blueing* exceeds anything of the kind we have ever examined, and should be in every family; the leather polish deserves a like favorable notice.

Wm. Brown, Oswego, knitting machine, ... S Med.

This machine is truly a "labor saver," and marks progress in the mechanic arts. With its use, the child of five years can knit a stocking in as many minutes. Simple in construction, and covers a space of about fourteen inches square, and stands at a height convenient for the operator occupying a common chair. The machine is well made and durable. Not only stockings and socks are knit by its use, but drawers, wrappers, etc., etc. Cost, $30.

Palmer & Co., New York, artificial arm, ... Large Med. & Dip.

The entry from which the above is taken, reads: "112, case of artificial legs and arms;" yet but *one* leg and *one* arm, were submitted for inspection (unless the illustration of the practical use

of another leg, of the same pattern, by a lady, to whose courtesy and kindness we are much indebted, be counted). Both these limbs were excellent specimens of mechanical skill in the manufacture. The arm was deemed by the committee the nearer approximate imitation of nature in its uses, having the rotary motion of the wrist joint, and all the motions in the joints of the fingers to the hand attached, in such close imitation of those of the natural hand and wrist, as to forbid suspicion in the casual observer or stranger, that the unfortunate wearer was not well supplied by nature.

The leg was a good specimen of workmanship, but was brought in direct competition with another, possessing *improvements*, in the judgment of your committee, and did not receive our approval. For further comments, see notice of leg presented by Doctor D. Bly, of Rochester, given below.

William Tefft, Syracuse, Clarke's chimney safe, ... Trans.

Mrs. C. Johnson, Brooklyn, case of perfumery, ... Dip.

Bramhall, Hedge & Co., New York, Winship's patent self-ventilating refrigerator, ... S. S. Med.

This article would be deemed *indispensable* by any family having it in use during the heat of summer. It must accomplish the object of its creation. Cost from $15 to $35.

Joseph Seymour & Co., Syracuse, case of masonic regalia, (elegant,) ..... Dip.

W. H. Farrar, Geddes, Rockingham, flint enameled ware, ... Dip. & Trans.

P. Clinch, Syracuse, willow cradle and basket, ... Barry.

Thos. Keredeque, Hillhouse, Ohio, lady's fancy toilet ware, ... Dip. & Trans.

This ware had no equal, in its class, on exhibition.

E. P. Torry, New York, coffee and tea pots, cans and jars, Trans.

E. P. Torry, New York, Shaler's patent carpet sweeper, (good article,) ..... Dip.

Thos. Benton, New York, Vesper gas fixtures, ... Dip.

A. J. Fullam, Springfield, Vt., set of Stensil tools, ... S. S. Med.

O. Witherill, Raymond, N. H., patent slide wrench, (an improvement,) ..... Dip.

John I. Watson, Buffalo, models of water wheels, ... Dip.

The above combine the direct and reaction water wheels; the wheel itself being a cylinder, standing perpendicularly, on the outside of which are flanges, or wings, protruding from and attached to the cylinder. These wings commence at top of cylinder and curve to the front, and receive the direct current of

water, which approaches in a horizontal column and strikes only one half depth of wheel; the wings change their direction from the front to the rear, and continue on an inclined plane to the bottom of cylinder; the weight of water on these inclined planes, surrounding the cylinder, constitutes the reacting property of the wheel; the wheel and flanges move in a cylindrical floom. This wheel was patented January, 1858, and invented by Frederick Smith, of Buffalo.

S. M. Basset & Bro's, Syracuse, penmanship and card writing,..... Dip. & S. Med.

This exhibition of penmanship, and drawings and engravings, with a pen, was exceedingly fine, and exceeded that of Messrs. Bryant & Stratton, of Buffalo, in two pieces only—the bank bill and the portrait—crowning efforts of the artist.

N. Fitch, Painsville, Ohio, lady's hollow toilet ware,..... Trans.

J. Holyland, Rochester, cracker machine,.....Dip. & Sm. Med.

The improvement in this machine, which entitled it to commendation, is the india rubber spring in crank, which increases the facility and ease with which it worked.

Adam Henry, Lewiston, Niagara county, beadwork and bows and arrows,..... Dip.

D. G. Stafford, Syracuse, improvement on condensing coffee pot,..... Dip.

The "improvement" *claimed* and *possessed* in the coffee pot examined, renders it preferable to the "Old Dominion coffee pot," and it is furnished, for one-half the money demanded for the latter. By its use, the aroma, generated in boiling coffee, is preserved and returned to the article for use, instead of escaping in the form of steam, as in the ordinary mode of preparing this article of luxury for the table.

I. Rodgers, Owego, Tioga Co., blind apparatus, ... Dip.

The article exhibited under the above entry, was an apparatus for fastening window blinds, when *open* or *closed*, and should be in general use.

Mrs. F. H. Gilmore, Syracuse, case of millinery,..... Dip.

D. D. Smith, Syracuse, case of dentistry, ... Dip.

Mrs. Lewis Aswaltz, Syracuse, bouquets and baskets, artificial flowers,..... Dip.

R. C. Williams, Syracuse, pork barrels; best,..... Trans.

R. Wood, Syracuse, case of confectionery, ... Dip.

James Baker, Canastota, pork barrel and butter tub,..... Barry.

O. F. Wood, Syracuse, case whips, ... Dip.

O. F. Wood, Syracuse, case gloves and mittens, ... Trans.
Mrs. J. Worts, Syracuse, case millinery, ... Dip.
Miss E. Brace, Salina, case pressed flowers, ... Dip.
Miss E. Brace, Salina, bouquet dried grass, ... Barry.
Mrs. H. Allen, Syracuse ancient chair, ... Dip.
John H. Mann, Syracuse, show case and samples of coffee, Dip.
John Barker, Rochester, samples of cooperage, ... Dip.
H. McDonald, Jacks Rifts, Onondaga county, axe helves, a superior article, ... P. O. Report.
G. P. Murray, Syracuse, case of fancy dyeing, ... Dip.
Augustus Day, Detroit, Michigan, Day's shingle machine, S. M.
Augustus Day, Detroit, Michigan, shingles made on ground, Dip.
Mrs. O. F. Burt, Syracuse, pair of corsets, ... Dip.
M. Niver, Niverville, artificial coating, (medical,) ..... Dip.

This coating, when applied to a flesh wound or sore, will form a coat impervious to air or water, and greatly facilitate the healing process; tried and proved by one of our number. Its purchase and use is recommended.

J. D. Alvord, Syracuse, corn and clothes baskets, 2d best, Trans.
Samuel Green, Rochester, belt clasps, ... Trans. & Dip.

These clasps constitute a new, speedy and secure mode of uniting belting, used in propelling machinery, and only need general circulation, and reasonable price, put upon them, to secure their purchase and use in all our manufacturing establishments.

Jesse Patten, Tully, best corn baskets, ... Dip.
J. M. Jones, Palmyra, self-inking hand press, ... S. S. M.

Printed small things with great rapidity.

Elihu Walter, Syracuse, calf skins tanned with hair on, ... Dip.
John C. Thayer, Barker, Broome Co., rotary table waiter, Dip.
D. C. Kellogg, clarified dietectic saleratus, ... Trans.
J. D. Simpson, East Bloomfield, Peters' self-generating gas lamp, ... Trans. & Dip.
William Moore, New York, patent mortice lock, burglar proof, ... S. M. & Dip.

The committee was instructed, by the exhibitor of the above lock, in the manner of opening doors when locked, with the key in or out of the lock, by burglars; and dissected his "patent mortice lock," and by an examination, the committee was convinced that it was a decided *improvement*, and well worthy of commendation.

Mrs. E. T. Crocker, Syracuse, case pressed flowers, ... Dip.
Mrs. S. L. Howard, Syracuse, case pressed flowers, ... Dip.
George H. Green, Lafayette, rat trap, ... Dip.

Dr. D. Bly, Rochester, artificial leg, ...Large Med. & Dip.

This "artificial leg,' presented to your committee for inspection, was brought in direct competion with "Palmer's patent leg," before noticed in this report; we were, therefore, necessarily required to decide relative to their *comparative* merits, and, after a full investigation of their mechanical construction, materials used, and their adaptation to the accomplishment of the object of their creation, found no difficulty in arriving at a conclusion, satisfactory to ourselves, and which, we are confident, will be adopted or approved by our unfortunate fellow-citizens who are compelled to supply the want of *natural* by *artificial* legs.

We are unanimous in the opinion that the leg presented by Dr. Bly is the *best*, and that it possesses advantage over the "Palmer leg" very desirable to the user, and creditable to its maker.

These are: 1st. Its *weight* is less. 2d. No *metalic springs* are used in its construction, demanding frequent repairs. 3d. But *one* metalic *bolt*, (that at the knee joint,) is used. 4th. The ankle joint is so constructed as to admit of a lateral, rotary or side motion of the foot, (in exact imitation of that in the natural ankle,) thereby enabling the wearer to walk upon uneven surfaces, or step upon small stones or other slight obstructions, with less liability to stumble or fall; lighten the tax upon his *caution* as to *where* and *how* he steps to secure safety, and, in an equal ratio, diminish the physical effort necessary to its use. This leg combines the desirable qualities found in Palmer's with the *improvements* above enumerated, and is a nearer approach, in its anatomical structure and motions, when in use, to its "model," the natural leg.

We award the first prize to Dr. Bly for his *improvements*, and the evidence of *progress* in the mechanic arts, found in the construction of his "artificial leg."

J. T. Johnson, Brooklyn, apple parer,.....S. S. M.
Stone & Marshall, Cazenovia, city clock, ...S S. M.
C. F. Keyes, Gouverneur, package carriage shafts, .Trans. & Dip.
Harriet Leroy, Camillus, specimen of printing 1811, ... Dip.
J. K. Wackman, Auburn, patent weather strip under door, Trans.
E. Harris, Syracuse, specimen Scranton coal, ... Dip.
Jacob Nevkirk, Barton, Tioga county, model of lime kiln, with steam boiler attached,.....S. S. M.
F. B. Scott, Buffalo, sign painting, carved letters and store window shades, ...S. M. & Dip.
G. W. Hamilton, Oneida, animal traps,.....Trans. & Dip.

Miss Sarah A. Hunt, Syracuse, dress pattern, ... Dip.
C. Rust & Son, Syracuse, metalic burial caskets, plates and handles, ... S. S. M. & Dip.
V. B. Bates, Utica, Wordon's metalic boot clasp, ... Trans.
Wm. H. Brewer, Ovid, botanical map of N. Y. State Agricultural College Farm, Ovid, ... S. M. & Dip.
Webster Smith, Utica tomato catsup, ... Barry.
D. McMorran, Greene, Chenango county, case of knives, .. Trans.
J. C. Miller, Amsterdam, carriage and reaper springs, Trans. & Dip.
J. &. C. Chandler, Syracuse, case artificial teeth, ... Dip.
A. G. Salisbury, Syracuse, case shells, ... Trans. & Dip.
W. R. Williams, Salina, best flour barrel, ... Dip.
W. R. Williams, Salina, standing cask, ... Trans.
Minot Farrar, Saratoga Springs, Folman's self-ventilating bed, ... S. M. & Dip.
O. C. Crocker, Binghamton, four deer, ... S. M. & Dip.

Mr. Crocker, at request of committee, made and presented a "statement," which we herewith present for publication, with "awards."

To the Discretionary Committee:

Gentlemen—Having concluded to embellish my farm and grounds by building a park, and procuring a pair of prime deer from the forest in the immediate vicinity of my place, throughout the trial of four years, which I have devoted to that subject, I have surpassed my most sanguine expectations. My herd now consists of nine—three bucks and six does, which breed as rapidly as sheep. They require less food in summer and winter, than to keep the sheep; eight bushels of oats only, accompanied with a few cabbage leaves and refuse apples, having been required to carry five of them through the winter. They can be wintered entirely upon refuse apples, cabbage leaves and stumps, or turnips, vegetables being more natural, and consequently more palatable, than anything else. In summer they require grass only, and when pumpkins can be obtained, they can be fitted for the shambles more readily than neat cattle. They make the most beautiful pets, being readily tamed, and within twenty-four hours, after being taken from the dam, will follow their captor as readily as a puppy. And in our country, where the native deer have become almost entirely extinct, it becomes absolutely necessary to resort to artificial means for the preservation of the race, and providing our tables with that most delicious of all dishes, the venison steak. Every

owner and occupant, (if he has to the amount of five acres,) might have his park, provided he can have good pure water therein, (for no other will they use.) It need not be devoted to them alone, you may keep an unruly creature of any discipline commonly used upon the farm, without detriment to either. In relation to fencing, a good and substantial enclosure about nine feet high, is all that is required; one's own taste must be consulted in that respect. Mine is constructed of locust posts, eight feet apart, three feet in the ground; three oak rails, two by three, spiked on, and hemlock boards, about six inches wide, with space of about four inches between, up and down, and sharpened at the tops; boards nailed on either side to suit one's taste. This sample of four deer, were raised near Binghampton, and were exhibited on the Broome county fair grounds, during the exhibition last week, and the day after the fair, the large buck was allowed the freedom of the grounds. A rich treat was served up to the lovers of the chase, by putting five beautiful hounds upon his track; the buck, after passing four or five times around the course, keeping the hounds at bay throughout the race, gallantly brought up in front of the judges' stand, as if presenting himself for the judgment of his appropriate committee, after which, two grooms approached and led him by the horns from the grounds, amid the acclamations of the crowd.

Very respectfully submitted,

O. C. CROCKER.

Syracuse, *October*, 1858.

C. B. Loveless, Syracuse, self-generating gas burner, ... Dip.

The construction of this "burner," is such that any person may enjoy the advantages of a gas over those of other lights commonly in use, by using common burning fluid in one of these "burners." It occupies but little space (can be placed upon a common "light stand") and manufactures its own gas as fast as demanded for use. Cost of sustaining single burner ¾c. per hour.

J. W. Osborn, Albany, samples plain and ornamental slating and slate ridge, ... S. M.

George T. Anthony, Medina, Harrison's reticulated metalic block letters and devices, ...S. M. & Dip.

The design of the "metalic block letters and devices" is to supply the defect of "signs" to advertise *residences* or *places of business* during the evening, by placing the "open-work" cast letters in a window; they combine the ornamental and useful.

J. C. Loveland, Springfield, Vt., instrument for sharpening scissors, ... P. O. Rep.
D. G. Stafford, Syracuse, improvement on burner for burning fluid, ... Dip.
J. B. Creighton, Tiffin, Ohio, model of railroad sleeping car, ... S. M. & Dip.
Mrs. Wesley Hickox, Syracuse, dried grasses, ... Dip.
C. Van Benthuysen, Albany, N. Y. Agricutural Society's show bill for 1858, fine sample of art, ... Dip.
L. Losey, Manlius, carpet stretcher, ... Dip.
Mrs. Catherine Hand, Syracuse, vase wax flowers and lillies, most beautiful, ... Dip.
Major P. Mills, Binghamton, toilet bedstead, ... Dip.
H. P. Ames, New York, instrument to protect fruit trees from injury by insects, ... S. M.
Geo. F. Gray, agent "Elliptic Spring Bed Bottom Co.;" Howe's patent elliptic spring bed bottom and berth bottom for night cars, ... S. S. M.
Eliphalet Remington, Ilion, gun case and case of guns and revolvers, ... S. M.
N. Brisco, stands inlaid checker board, ... Dip.
P. Barber, Homer, agricultural design, ... Dip.

Respectfully submitted,

A. P. Sigourney, Watertown, Jefferson county; E. Cornell, Ithaca, Tompkins county; Reuben Robie, Bath, Steuben county, *Committee.*

Syracuse, N. Y., *October* 8, 1858.

Com. 79.

In the department of grapes the committee have had much difficulty in coming to a conclusion on account of the large number of entries of native grapes, and their very high quality. We doubt if the display has ever been excelled. After a careful examination ourselves, and after availing ourselves of the patriotic aid of many ladies and gentlemen of taste and experience, we have awarded the premiums: First premium for greatest number of native varieties, to A. S. Moss, of Fredonia, and the second to R. Cossitt, Onondaga. The first premium for the best one variety, to R. Cossitt, Onondaga. We believe these grapes were never equalled, either in the size of the berries or the bunches, or the quality of the fruit grown on the vine.

E. W. Leavenworth, Syracuse; A. H. McLean, Caledonia; T. S. Prevost, Greenville, *Committee.*

CULTURE OF THE CRANBERRY.

BY NOBLE HILL, OF STEUBEN COUNTY.

In compliance with the regulations of the New York State Agricultural Society, I make the following statement in regard to my cranberries. They are raised on a peat bog meadow, intersected with ditches, which I close in the spring for the purpose of flowing the land. During summer I endeavor to adjust these according to the weather, whether wet or dry, always desiring to keep the soil well saturated. The following is my practice in regard to transplanting: I pare off the surface and throw the result, sods, moss, brush, or whatever it may be, into large heaps, then loosen the new surface to the depth of two or three inches, and set with plants quite closely, as they will the sooner cover the ground to the exclusion of weeds. I keep them clean, *i. e.* weeded for two or three years, after which they require but little, if any, further care.

P. S.—A portion of the berries I exhibit were picked from vines set in the month of May, 1858.

CULTURE OF THE CRANBERRY.

BY ADDISON FLINT.

To the committee of the New York State Agricultural Society:

I wish to enter the list of competitors at your State Fair, for the premium on cranberries.

The method I have taken to cultivate them is as follows: In the autumn of 1843 I built a dam to flow a swamp from which I had cut off the wood, (then covered with bushes.) I kept it flowed until August, 1846, then let off the water, and in October following burnt over the swamp and set the vines, (about one acre. I found at this time a few small patches of native vines.

I set my vines in hills about three feet apart, each hill of vines about the size of a quart measure. I set my vines in the most

simple way—raise a little mud, and with the hoe put the vines under, and tread on it with my foot; then pass to the next.

My swamp contains about eight acres. I planted about half an acre with cranberries, one in a hill—crushed between the thumb and finger, and placed just under the mud. I also sowed broadcast three or four bushels of refuse cranberries the spring following.

The berries sown and planted made but little show for four or five years. They are now filling up the meadow with vines, and bearing berries.

I had but little to do with them the first few years; but when the grass came in I went with my scythe and topped the grass above the vines in June, and in places it still needs it.

I flow my meadow in the winter, and keep the water on until warm weather, so as to start vegetation; then take it off, so as to let the vines out of water; then let it remain till spring frosts are over; then take it down level with the meadow, to remain until the berries are grown, say from 10th to 15th August; then drain it off for picking.

The proceeds are as follows:

In 1850 sold 17 bushels,	$26 20
1851 sold 28 bushels,	70 00
1852 sold 93 bushels,	300 00
1853 sold 52 barrels,	380 00
1854 sold 47 barrels,	305 00
1855 sold 50 barrels,	650 00
1856 sold 64 barrels,	672 00
1857 sold 15½ barrels,	107 00

In 1857 they were injured by frost.

The cost of building dams and setting vines $50.

North Reading, *September* 28, 1858.

WHEAT MIDGE, HESSIAN FLY, &c.

We issued the annexed circular to upwards of one hundred gentlemen, engaged in farming, in May, 1858, in order, if practicable, to obtain some reliable information in relation to the history and ravages of these insects in our wheat crops. We regret to say that the annexed eight letters are all we have received in answer to this circular. We the more regret this from the facts which are given in the letters received; as we feel assured, if a general response had been given, we should have had materials from which some valuable results would have been secured. We have some facts which are of value in these communications; and we are greatly indebted to the gentlemen who have answered our inquiries. We intend to re-issue the circular, hoping to secure a much more extended reply, and thus be enabled to ascertain more fully the appearance and ravages of the insect, as well as the means by which their ravages may be ameliorated, if not entirely prevented.

The *Hon. Gamaliel H. Barstow*, of Tioga county, states that the wheat midge appeared in that section of the state about 1848; and that they came from the east, having been seen in Columbia Co., in 1838; that its ravages have been continued, more or less in Tioga, since 1848; but much less for the past two years, and hopes are entertained that it may be passing away. The best remedy that has been found, is to have the lands well cultivated, good seed sown, so as to secure *a healthy crop*; all other things being equal, the damage is much less.

John Johnston, of Seneca county, says the midge appeared in that county in 1848—same year as in Tioga—coming from the east. It has continued its ravages more or less since. The best means of mitigating its ravages, have been thorough drainage and better farming—giving earlier crops. Crops on dry lands and uplands less liable to injury than low, sheltered lands. Mr. Johnston has usually grown good crops of wheat; since the midge appeared, his crops have not been under twenty-five bush. per acre,

except in 1857, when he had a little over twelve bushels per acre; that owing mainly, however, to the great drouth of the previous autumn, and the cold and late spring of 1857.

Hon. *Joshua B. Smith*, of Suffolk county, says that the wheat midge is unknown in his neighborhood. The Hessian fly has done some injury.

Hon. *Samuel L. Fuller*, of Livingston county, says a circular was issued by the agricultural society of his county, but few answers were received. The ravages of the fly have been very destructive; dry lands escaped if any; Mediterranean wheat has suffered the least.

Hon. *James S. Wadsworth*, of Livingston, writes that the midge appeared in Monroe and Livingston counties in 1854, to a limited extent; came from the east. In 1856, one-half to two-thirds of the crops of wheat on *upland* were destroyed, and *nearly all* on the flats. Worse in 1857; over two-thirds of the crop; and in 1858, very little to harvest of white wheat.

Mediterranean wheat escaped generally, (from its being earlier as it is supposed,) perhaps one-fifth destroyed. There is no evidence that the midge was seen in the Genesee Valley before 1852, when it was seen in small numbers, in Monroe. The ravages of the midge has reduced the value of all the wheat lands in Western N. Y., at least forty per cent. Lands which sold readily at seventy dollars per acre, are now bought for forty dollars per acre. Mr. Wadsworth states that a respectable farmer, Mr. Coverdale, in Livingston county, lived, in 1828, on the St. Lawrence, forty miles above Quebec; saw the midge there that year, and had previously seen it in England, so that it is probable the midge was introduced there from England.

Hon. *Stephen Haight*, of Dutchess county, writes that the midge appeared in that county about 1828, and steadily increased from year to year, being more and more destructive, for twelve to fifteen years, when the growing of wheat was mainly given up. In past two years, both spring and winter wheat have been grown to some extent. Crops good, and no trouble with the midge. Uplands were invariably less injured by the insects than low lands. Mr. Haight is of the opinion that since abandoning wheat, and turning attention to other crops and grass, the farmers have secured a better profit from their farms than they ever did by growing wheat.

Joseph Watson, of Wayne county, writes that the midge appeared in 1850 and 1851, and increased up to 1858. It has not en-

tirely disappeared. Mr. Watson further says, that in Schoharie county, in 1835 and 1836, an injury by a worm, in the heads of wheat, similar to the larva of the wheat midge, appeared in the wheat. Dry uplands are very perceptibly less affected than low lands. Since 1852, the wheat crop is one-quarter short of a full crop; that is, less than one-quarter as much wheat has been produced, caused indirectly by the appearance of the midge. Early sowing on dry lands, and early varieties most successful, but no effectual remedy.

Hon. *G. Denniston*, Steuben county, writes that about 1854, some indications of the presence of the midge were discovered. The crop of 1858 was mostly destroyed. Estimates the damages by the wheat midge, at seventy-five per cent of the whole crop. No remedy has been found against its ravages. No satisfactory answer is given as to where the insect came from; but the fact stated by Mr. Coverdale, of the insects being seen near Quebec, would render it probable that in that section of the country, it may have been introduced from England. Mr. Haight states that about 1828, the same year mentioned by Mr. Coverdale, the insect made its appearance in Dutchess county. In England, the midge prevails to some extent. A parasite insect is known there, that mitigates its ravages. No evidence has been procured here that any parasite has been seen in this State. In England, it is believed that the thorough culture and preparation of their lands, and the use of good seed, have tended, as yet, to prevent the ravages of the wheat midge to any very considerable extent.

The insect has not left any section of which we have an account in these answers, since its first appearance, except as stated by Mr. Haight, in Dutchess. The entire abandonment, however, of the crops there, may have been the reason; and if the raising of wheat which has been lately commenced there, should progress, we may find that the enemy is still in that region, ready for its destructive work.

We think that there is sufficient evidence, given to show that *good farming*, thorough drainage when needed, will at least very materially mitigate the ravages of insects. The experience of Mr. Barstow, and Mr. John Johnston, show that this has been the case in their experience, and it certainly will prove advantageous to our farmers, to make their efforts in this direction, if they intend to continue the wheat culture. Good farming will probably enable them to raise at least moderate crops, and without this, it is

quite certain that the culture of wheat will, while the insect remains, prove a very unprofitable business.

We would earnestly urge upon gentlemen to whom our circulars shall be sent the coming season, to give us all the information in their power; and should there be a response from every county, we shall probably be able to compile a table, showing the appearance of the insect, the progress made, the time of its disappearance, and the extent of its ravages. Surely this would prove of great value to us hereafter, and facts may be collected which will enable us to adopt some system by which we may again be enabled to raise wheat to advantage. J.

CIRCULAR.

NEW YORK STATE AGRICULTURAL ROOMS,
ALBANY, *May*, 1858.

RAVAGES OF THE "WHEAT MIDGE," "HESSIAN FLY," AND OTHER DEPREDATORS ON WHEAT.

Wheat Midge.

The ravages of the wheat midge in this country, so severe and continued year after year, forms one of the most important incidents in the history of wheat culture, which has ever occurred. And the State of New York is prominent as the scene of the depredations of the insect. The statistics returned to the State Agricultural society in the year 1854, showed that the farmers of this State had that year experienced a loss of *several* millions of dollars from this pest; and in 1857 one of our citizens was injured to the amount of several thousand dollars by it; and in some sections of our State the wheat crop was almost entirely destroyed. These facts will serve to indicate to what an extent the wealth and prosperity of our State are at present affected from this cause. And the Executive Committee of the State Agricultural Society feel it to be a duty which they owe to their constituents and posterity, now, when the whole history of this insect and its ravages are fresh in recollection, to gather up full information upon these topics, and embody the same in a report, which will give a clear view of the remarkable career of this insect, its habits and economy, and will form an authentic record of these important facts for reference in all coming time. They therefore issue this circular, with the earnest hope of hereby obtaining the requisite information from each particular district, in all the wheat growing sections of the State, not doubting but that the persons to whom this circular is directed, will be able, from their own knowledge,

or by conferring with a few of their neighbors, to give in answer to it every fact of value relating to this subject which has occurred in their vicinity. Replies more particularly to the following queries are desired :

1. In what year was the wheat midge (weevil as frequently called) first noticed in your neighborhood ? From what direction did it appear to come to you ? Was it very destructive for a few years after its first arrival ? Was the growing of wheat abandoned, and for how long a time ?

2. What has been its history since ? In what years has it been most destructive, and when has it been least injurious ?

3. Has it wholly disappeared at any time ; so that on examining the wheat heads in many different fields not one of the yellow maggots could be found ?

4. Before the midge came in your vicinity, is any instance remembered thirty years ago or more, in which a field of wheat was badly injured in the same manner it now is by this insect—with the heads rough and ragged, and the kernels shriveled ? If so, state the year and the particulars, so far as remembered.

5. What other grains have been infested by this insect ?

6. Have any varieties of wheat escaped injury ?

7. Are crops upon dry, hilly uplands less injured than those upon lowland intervales ?

8. What has been the amount of damage in your vicinity the past year, and the probable yearly damage since the midge came into your neighborhood ?

9. What remedies have been tried and with what success ? Has any remedy proved effectual.

10. Has any parasite insect been seen which destroys the midge? If so, describe it.

11. Has any damage to wheat been made by the "Hessian fly" or other insect than the wheat midge ? If so, describe the same.

Finally, state any other facts of interest within your knowledge relating to this insect.

It is recommended that specimens of the wheat midge or any other insect supposed to be injurious, which may be observed, or any parasite insect which is supposed to destroy the wheat midge, be sent to the Agricultural Rooms. They can be sent in a quill, enclosed in a letter, and an examination will be made by Dr. Fitch, Entomologist of the society, of all that may be received. The replies which may be received will be delivered to Dr. Fitch, and a carefully prepared statement will be published, embodying all

that may be ascertained in relation to the insects, which may be described, and copies will be sent to all persons answering these inquiries. Returns are requested to the Secretary, Agricultural Rooms, Albany, as soon as the questions proposed can be satisfactorily answered. B. P. JOHNSON, *Secretary.*

HON. G. BARSTOW—Nichols, Tioga Co.

March 9th, 1858.

B. P. Johnson, Esq.

My Dear Sir—In the journal of the State Agricultural Society for December, I noticed a circular of the Executive Committee of the Society, making some inquiries in relation to the history of the *wheat midge* (or weevil), as it is sometimes called. I have been a small farmer in the valley of the Susquehanna, for about forty years, and have grown wheat in a small way during that time. Since my residence here, the Hessian fly has made us two visits, and the midge one.

I shall endeavor to answer all the questions of the Committee though perhaps not exactly in the order in which they stand. I should think it was about ten years since the midge first appeared in this part of the Susquehanna valley. I presume they came from the east, as I well recollect seeing them in Columbia county, in this State, in 1838.

Their progress westerly seems, therefore, to have been very slow; but I believe they have traveled west with more rapidity within the last few years. Like Young America—they seem now to be rapidly going in the direction of Kansas and California.

The *midge* was not so destructive at its first appearance as afterwards. Its ravages very soon discouraged our farmers, and less and less wheat was sown till about 1855. Very little was sown in 1855. The harvests of 1855 and 1856 were the smallest we have had here. We have not wholly discontinued sowing wheat here at any time. In my own small way, I have continued to sow wheat every year, and never had less than half a crop, except once. In 1855, very little was sown; but, of that little, most of it escaped the midge; more was sown in 1856, and the crop in a great measure escaped; particular pieces on low ground suffered some; the harvest of last year having generally escaped injury. We sowed last fall about as usual. I never saw or heard of the midge in this valley until about ten years ago. I have resided here since 1812.

It has appeared in rye and oats, but in those grains but little injury has been done. The rye crop ripens too early for them, the oat crop too late in the season. They seem to commit their depredations upon the grains immediately after the blossom falls off; and there seems to be but a few days in which they do the injury. I should think about the second and third weeks in July is their time of visitation. If wheat is ripe by the middle of July, in our climate, it is a little too forward for the insect, it being out of the milk before the insect appears. No variety of wheat has wholly escaped the midge; but from my experience and from information from others, it is well settled with us that the *Mediterranean wheat* is the best. It ripens a week earlier than any other I have tried; I have begun my harvest of that kind of wheat the 12th of July; other wheat sown in the same field, and alongside, I have often known to be a week later. On the low flats or bottom lands on this river, the midge has been the most destructive. On *the high grounds back* from the river they have done less injury. No remedies have proved successful against the ravages of the midge; lime has been sown in the morning, when the dew was on, when the midge first appears; but I believe the injury to the sower has been greater than to the midge. No parasite insect has been seen here, to my knowledge, which destroys the midge.

I believe it is pretty well ascertained that all the insects and blights, which attack the industry of man through his crops, after a time disappear. The *Hessian fly* has appeared at various times, since I have had some knowledge of farming. My recollection now extends back more than sixty years; within that time the visits of the Hessian fly have not been very frequent, perhaps once in fifteen or twenty years. By changing the time of seeding, and sowing very late, the Hessian fly soon disappears. The Hessian fly attacks the early sown wheat, and the midge the late sowed. Luckily, the two insects do not both appear at once; coming singly we must cheat the midge by *sowing early*, and the Hessian fly by *sowing late*.

For the last two years I have sowed the Mediterranean wheat, and sowed the first week in September, and have seen nothing of the midge in my fields. The last time the Hessian fly paid us a visit, I changed my seeding time to the last week in September, and first week in October, and I saw no more of the fly.

Should the Hessian fly and midge combine their forces and attack the farmer at the same time, I suppose we should own beat,

and stop raising wheat till we starved them out. From the small amount of damage done here by the midge, within the last two years, our farmers begin to take courage that the midge is about to leave us.

In relation to the midge, as well as the Hessian fly, I have found *that crops of wheat of a healthy growth, where the land is properly cultivated*, all other things being equal, *the damage from either of those insects much less* than where the crop is but half put in, and the wheat of a poor and sickly growth. Let the indolent *half farmer* mend his way, and prepare and cultivate his land so as to get a healthy growth of wheat, and sow it so as to get an early harvest. In that case he will be beforehand with his enemy; but on the other hand, if he neglects the proper cultivation of his land, and puts off the proper time of sowing his seed, he may expect what *he* calls *bad luck* in crops, when his bad luck is nothing but the necessary consequence of bad conduct.

Yours, respectfully,

G. H. BARSTOW.

JOHN JOHNSTON—Near Geneva.

May 26, 1858.

B. P. Johnson, Esq.,

Secretary New York State Agricultural Society:

Dear Sir—I have received your circular respecting the wheat midge. The first season we noticed it in this county (Seneca) was in 1848, but I have no doubt we had some for two or three years previous. It came from the east to us. It had destroyed the crops of wheat in the eastern counties of this State a number of years before we knew anything about it but what we read in the papers, and fifty miles east of here it had ruined their wheat crops before it injured us. In 1848 it was not very destructive here, but in the following year it ruined the greater part of the crop on many farms, and on some totally. In every late season since, it has been very destructive, but in early seasons when wheat was ripe (or nearly so) by 10th of July, the damages have been greatly lessened. My own farm being *underdrained*, I have been able to obtain fair crops of wheat since the *weevil* or rather *midge* made its appearance. My crop has not been under twenty-five bushels per acre, with the exception of last year which was only a little over twelve bushels per acre. The failure last year was owing to the great drouth of the previous autumn and the unprecedented cold and late spring of last year. My wheat never

covered the ground until sometime in June, and was not ready to cut until 29th of July, later than I ever knew it in thirty-seven years, the remarkable season of 1836 excepted. I commenced on the 29th of July that year also, but had a good crop, which was the only full crop I ever had that was not fully ripe by 17th of July.

I sow *salt* liberally on my wheat which generally *hastens* the maturity about four days, and that may almost save the crop from the midge. I would state that my wheat crop during the time of midge has been from fifty to eighty acres; this season only forty-four, but this autumn I will sow sixty acres. Were my land *not underdrained* I could not raise wheat any better than many in this county who have abandoned wheat as a crop. If wheat could be got nearly ripe by the 10th of July the loss from midge, I think, would not be great, and nothing but *underdraining* and a *higher grade of farming* to *bring the wheat earlier forward*, is the only way I can see for continuing the wheat culture in this State. We have never been one year free of the midge since 1848. In 1855 I found only a little and that only around the fences or on some spot not throughly drained.

A number of years ago, perhaps about thirty, the heads of wheat were injured, resembling the heads injured by midge, but it was not midge, but a small white worm which did considerable damage. The following year we still had a few, but since I have never seen them.

Barley, I am told, is often injured by midge. I seldom grow that crop; when I have, I have not seen any midge in it.

The *Mediterranean wheat* is least hurt by midge, but no wheat escapes it. Crops on *dry land and on hilly land are less liable* to be injured than in sheltered places. I have heard of many remedies, such as sowing lime as the wheat comes in ear, going through the field with torches during the time of midge; but I have been only using preventives, and not cures. I have not known of any parasite insect destroying the midge. A small bird picks a great many of the larvæ out of the heads of the wheat and I am told they have been killed and their crops found full of it.

There has been very little damage by Hessian fly. In 1831 it was very destructive to me, and again in 1844, being the only times in thirty-seven crops. But we have in this neighborhood some loss this year by a clear white worm in the root. It has taken, almost totally, some of the best looking wheat I ever saw at the same season of the year; it commenced its depredations

perhaps six weeks ago and spread rapidly in some fields, while in others there may be a few yards or even only a few feet ruined, and in others again to a considerable extent. On one field of thirty-five acres in this neighborhood there is considerable of it ruined, and although it looked the best I ever saw last fall and early this spring, I am afraid there will little of it make a crop. It is a very small, active, white worm; when looked at through a glass it appears to have two feet at each end; it is exceedingly bad to find, especially now; I have a friend trying to find some of them to send you in this letter. He tried yesterday without success, and is trying again to-day. I am well aware the same worm damaged my crop in 1844 more than the Hessian fly. I noticed some worms of the same kind in 1844, and from the appearance of the wheat they have destroyed now, I know it was these that half ruined my crop in 1844. They have now quit their depredations for this season. The roots of the wheat have sent out new shoots but it will never come to much (some of it, much of it to nothing). A great deal of mine, in 1844 never headed out. I sowed very early in 1843 and I have no doubt that was the cause of failure by that worm then and also now. I never began sowing before the 20th of September from 1831, until within a few years past, 1843 excepted, hoping to get my wheat to ripen early, and I notice it is all the earliest sown wheat that is affected by the worm, or at least that most forward in the fall. In 1843 I sowed early so as to have done before going to the State Fair at Rochester, which was the cause of reducing my wheat crop about 1,000 bushels. I have no doubt it is very unsafe, this sowing in the end of August or first of September; at least I know it is so hereabouts.

I have only a few very small spots taken by worm in my wheat. It did not come up until the 20th day of September, or at least not much of it. On fourteen acres on which I sowed a barrel of salt to the acre, there is none, while eleven acres adjoining and in the same field, has several spots taken by the worm, and even up to the division furrow, between the salted and unsalted. The fourteen and eleven acres were both sown at the same time, and both early, but dry weather set in and it was long in vegetating, which I think saved the crop. I have very little doubt but many crops have been destroyed by the same worm and the blame laid to Hessian fly. They are exceedingly bad to find, and as there is almost every year some little Hessian fly, if we find a few we are apt to think they do the deed or do all the mischief. I am now

fully convinced it was so with me in 1844. I go back to 15th day of September, before commencing sowing. If one of the worms can be found I will enclose it in this letter and mention I have done so.

Yours truly,

JOHN JOHNSTON.

Hon. JOSHUA B. SMITH—Hauppauge, Suffolk Co., L. I.

June 17th, 1858.

B. P. Johnson, Esq.,

Dear Sir—Your circular of May directed to me, proposing several inquiries in relation to the destructive ravages of the wheat midge, has been duly received. In answer to inquiry, first in what year was the wheat midge first noticed in your neighborhood? From what direction did it appear to come to you? Was it very destructive for a few years after its first arrival? Was the growing of wheat abandoned, and for how long a time? Answer.—The wheat midge is unknown in my neighborhood, and so far as I have been able to ascertain, in my town and county. The answer to the first, renders one to the nine following needless. In answer to the eleventh inquiry, whether any damage to the wheat has been made by the Hessian fly. The wheat crop, until the past and present year, have generally escaped serious injury by the fly, for the past ten or twelve years. Last year it was again visible; and the present one the complaint is more general of its destructiveness; some crops will be injured by it. To what extent, I am now unable to say. I have sown the Mediterranean for the last twelve years, and have never seen any signs of the fly until the last and present years.

Respectfully yours,

JOSHUA B. SMITH.

SAMUEL L. FULLER—Conesus, Livingston Co., *Nov.* 12, 1858.

Hon. B. P. Johnson, *Secretary, &c.*:

Dear Sir—In October, a son of Mr. J. S. Wadsworth handed me your circular in relation to the "wheat midge," "Hessian fly," and other depredators on wheat.

The Livingston County Agricultural Society issued the enclosed circular, and circulated about one thousand among the farmers of this county. In reply, I have received six communications, eliciting no valuable information further than this: the early ripened, and quickly ripened wheat, escaped the best.

The summers of 1856 and 1857, I spent in Seneca county, and only know by report, that the wheat was injured over a large section of the county in 1856; I had heard it was in Ontario county the year before, but it was a rumor; still I always supposed it came from the east. The growing of white wheat has ceased to be the crop of the Genesee Valley. The Mediterranean wheat is said to be much improved for the last year or two, and many suppose it may be made a partial substitute; we shall probably raise enough for our bread of Mediterranean.

1857 and 1858, the white wheat was destroyed, with now and then an exception. It has not disappeared at any time.

I have never heard of the wheat being injured years ago by the midge. Some of my friends have complained of the midge in their barley; and I have heard rumors of clover seed being injured also; but this latter not sufficiently reliable for me to state it as a fact.

The Mediterranean has been injured the least.

The *dry land escapes* if any does.

The damage is the entire *profits* of the wheat crop at least, and the consequent depreciation in the value of lands of at least of $20 per acre, in the wheat growing towns of this county.

We *have tried good farming* with partial success.

Know of no parasite which destroys the midge.

In 1856 there was considerable damage by what was called Hessian fly in this neighborhood. The stalk was eaten into near the lower joint, and the straw would break off, many small worms being found in the stalk.

I have no knowledge in regard to the midge, other than most of farmers—that we find a fly about the size of a musquito in the fields, and soon the little red maggots in the head.

I have waited the answering of your circular, hoping "something might turn up." There are a few men in the county who will act in this matter of the midge; but the large majority seem inclined to consider it a visitation of Providence, and sit quietly down under it. Perhaps they are the wisest.

Very respectfully yours,

SAMUEL L. FULLER.

Hon. STEPHEN HAIGHT—WASHINGTON, DUTCHESS CO.

June 7th, 1858.

Friend B. P. JOHNSON:

I am in receipt of a circular which purports to be issued by the Executive Committee of the New York State Agricultural

Society, for the purpose of collecting information concerning the ravages of the wheat midge. I am happy to render any service which will assist in so important a matter.

To query 1. I answer to best information and recollection: Their first appearance was about thirty years ago in my county. They pretty steadily increased from year to year; their ravages more and more destructive for some twelve or fifteen years, when our farmers were obliged to abandon wheat growing entirely. Some few farmers, the two years past, have ventured to sow a little wheat, both winter and spring wheat, and I have had good crops; no trouble with the midge; we consider they were northern emigrants.

2. I am not prepared to answer to a certainty.

3. The two years last past, I have heard no complaint of any injury by them.

4. I have no recollection of anything of the kind, and presume I may safely say no.

5. No other grains have been injured by them.

6. No varieties escaped, although it was always understood that the bearded varieties were injured the least.

7. Wheat growing on uplands *were invariably injured less* than upon lowlands.

8. It would be a difficult matter to get at the damages sustained by the farmers of Dutchess, during the twelve or fifteen years that they were trying to raise wheat—and getting straw instead of wheat. It must be, however, a very large amount; but after abandoning the raising of wheat entirely, and giving their attention to other crops and grass, I am of the opinion their farms have yielded a better profit than they ever did by growing wheat.

9. I don't know of any remedy, unless by refusing to raise wheat to feed them. We have starved them out.

10. Don't know of anything of the kind.

11. During the time that wheat was generally sown, it frequently happened that it was much injured by the Hessian fly.

12. I hope we have got rid of them.

Yours, respectfully,

STEPHEN HAIGHT.

JAS. S. WADSWORTH, Esq.,—Geneseo, Livingston Co.

My Dear Sir—I hope your other correspondents have been more attentive than I have to your excellent wheat midge circular. I

will answer your questions as well as I can—premising that I am not a close observer in such matters, but I have made a good many inquiries in this matter. The midge was seen here in 1854; a little in Monroe and Livingston counties; did no material damage; more seen in 1855; did no material damage in this county; considerable in Monroe; came from the east. In 1856, the midge took from one-half to two-thirds of the crops in this county on upland, and nearly all on flats; at least 2000 acres on flats, which would have yielded thirty bushels per acre, not harvested. Worse in 1857, took over two-thirds of crops; 1858, very little white wheat to harvest; a few fields escaped; generally destroyed. Mediterranean wheat escaped generally (as it is supposed from being earlier); perhaps one-fifth Mediterranean destroyed; spring barley very much injured this year by midge. In some cases, one-half to two-thirds crops taken. Winter barley too early for midge. *Very little* white wheat now sown in western New York.

No evidence that the midge was seen here (Genesee valley) before 1852, when it was perhaps seen in small numbers in some localities in Monroe county. The midge has reduced the value of all the wheat lands in western New York, at least forty per cent. Lands which sold here readily for $70 per acre, can now be bought for $40 per acre.

No remedies tried. No parasite insect seen; very little Hessian fly of late years. The enclosed extract from the census returns of 1855 are supposed to be tolerably accurate; not too high; it is not supposed that this county and Monroe, will have a supply of wheat this year.

Mr. Coverdale, a respectable farmer in this county, lived in 1828, on the St. Lawrence, about forty miles above Quebec; saw midge there that year; had previously seen it in England. I do not think of any other information I can give you. I hope you will soon let us have what you have collected. Is this an English insect? What is done for it there? What of the parasite? Has it left any region in which it was ever fairly established.

Truly yours, JAMES S. WADSWORTH.

August 30th, 1858.

JOSEPH WATSON—Clyde, Wayne Co.

1. Midge appeared in 1850–51, from the east; growing wheat never entirely abandoned.

2. The insect increased annually until 1858; then least destructive; in *cold wet seasons* which were *late* the most.

3. It has not totally disappeared at any time.

4. Before the midge came do not recollect in this section of any injury to wheat similar to this, (but, in *Schoharie county*, my father says, in about 1835–6, a worm a quarter inch long, white, brown head, appeared in wheat heads and *roughed* them, or the birds did it in catching the worms, but they have not appeared since. Father died twenty years since in that county.)

5. Summer barley, red clover and mullen, have been infested by this insect; most in 1854.

6. No variety of wheat has escaped.

7. Dry *hilly uplands very perceptibly less affected* than lowlands.

8. As to damage, can't say very definite; this year not much, as no great breadth was sown; but it is safe to say that the wheat crop product here, since 1852, is less than one-fourth of a full crop annually, before or without the midge. I mean to say in my answer to this, that probably less than one-fourth of the wheat has been produced, that would have been, had there been no midge; but as to the damage itself, it would be hard to determine, as much of the land upon which wheat would have been sown, has been put to other more sure crops; besides, my experience is, that where I could get thirty bushels white wheat, I could get only twenty to twenty-two bushels of Mediterranean. *The loss or damage to our* county is *hard to over estimate*, caused by this *yellow mite*.

9. As to remedies, early sowing on dry lands and early varieties most successful, but no effectual remedy.

10. I have no knowledge of any parasites; report says there are such, but never have discovered any.

11. Too early sowing, to *escape the midge*, has the tendency to encourage the Hessian fly, and in some instances has done so. (First a white, changing to a flax seed form and color, near the root.) This destroyed my spring wheat, June, 1855.

Yours, JOSEPH WATSON.

December 20, 1858.

HON. G. DENNISTON—Prattsburgh, Steuben Co.

January, 21, 1859.

B. P. Johnson, Esq:

Dear Sir—I received your circular soliciting information respecting the ravages of the weevil or wheat midge, in Steuben Co. I have delayed my reply until all the facts in relation to the crop of 1858 could be collected. These, I can assure you,

have presented a gloomy picture to the farmer of our section of the State.

Some eight years ago we heard of the midge being seen and felt in some of the counties eastward. In Cayuga, then afterwards in Ontario, and then, the next year, in Yates; but, as yet, we knew nothing of the insect, except from report. It seemed to us like some *eastern plague* traveling westward, with which, in turn, we were doomed to be afflicted.

Our wheat crops grew luxuriant and productive, while our neighbors of Ontario and Yates, complained of their being "cut off." We had full garners of fine plump grain, while they reaped little else but straw and chaff.

About five years ago, some of our farmers began to discover appearances of the midge in their wheat. A corner of a field, or the outer edges, were somewhat injured, but nothing very material was developed for a year or two; but gradually the ravages seemed to increase, particularly in the crops more backward and late. It was then said "you must sow your wheat so that it will come to maturity early, in order to escape the (weevil), midge." Our farmers consequently sowed earlier than usual, but the *winged enemy*, by some means, managed to make their appearance just at the particular time they could commit the greatest injury; as if to put to nought all our wisdom and precaution, they totally destroyed all our earlier crops, and left the later unscathed.

Then, to avoid the insect, our farmers sowed late, so that the crop would come in after the period of its ravages. Some of our spring wheat, by this, has escaped; but I know of no particular rule that will guard us against its ravages, like all spoilers of the property and substance of others, they are ever on the alert for plunder.

The crop of 1858 was mostly destroyed by the (weevil) midge. The winter wheat did not average more than five bushels per acre throughout the county; whole fields were hardly worth harvesting. The spring wheat, sowed late, fared better and produced a fair yield. I should calculate that, on the average, the midge destroyed the crop of winter wheat in our county, to the value of *seventy-five per cent of the whole crop.*

I have heard of one or two fields, where the midge did not make their appearance, and the yield was consequently from twenty-five to thirty bushels per acre; these are now the exceptions to the general rule.

If the midge continue as last year, we must leave off sowing winter wheat, unless, perchance, we can hit upon some means to prevent their depredations. Our farmers are "*experimenting*;" but as yet without avail. About the time our wheat crops are in *the blow*, we can see myriads of pale yellow flies, with slim bodies, on gossamer wings, flying swiftly from head to head, depositing their "OVA," and as the crop matures we find the heads *erect* and empty, or rather *erect*, because they are devoid of value.

We are now in the midst of the plague; how long it will remain we have no means of ascertaining; but like all others, *we hope* for the period of its departure.

Very respectfully yours,

G. DENNISTON.

WHEAT AND CHESS.

In March, 1857, Benj. Hodge, Esq., of Buffalo, "offered a premium of $100 to the person who shall demonstrate that wheat turns to chess. The premium to be awarded under the supervision of the New York State Agricultural Society, under such rules and regulations as a committee appointed by the Society shall prescribe."

We received a letter, 20th July, from Samuel Davison, a respectable farmer of Greece, Monroe Co., saying "that on the 10th of March last, he commenced an experiment on wheat, to produce chess therefrom; and the experiment has succeeded; and requesting to have a committee appointed to examine the wheat growing, to test the truth that wheat turns to chess." He also requested that the committee for next year be appointed to try the experiment under his direction, &c.; and he claims the premium offered, &c.

As here was a direct offer and an acceptance, it was thought advisable to have a committee selected, and an examination and thorough trial had. J. J. Thomas, of Cayuga; Prof. C. Dewey and L. B. Langworthy, Esq., of Rochester, were selected as the committee.

The committee met at the office of the Rural New Yorker, in Rochester, on the 5th of August; and Mr. Davison was present with the wheat and chess which he had grown. The committee, after obtaining all the information from Mr. Davison, as to the manner of preparing the ground and managing the same after the wheat was sown, proceeded to separate and examine the stalks presented; but after a careful examination under the microscope, they were unable to find any chess growing from the wheat; but as the grain and husks were so much decayed, nothing satisfactory could be determined. A report will be presented of the whole examination, by the committee. The committee, as requested by Mr. Hodge, drew up regulations for a trial hereafter, which was satisfactory to Mr. Davison; and persons will be

selected to make the trial under the direction, as to management, of Mr. Davison, and the result will be given another season.

We are glad that a careful and well-arranged trial is to be had; and we shall hope that a trial conducted with all the care required by the regulations of the committee, will, in a single year, prove satisfactory.

We were present with the committee at their examinations, and though, on the question of wheat turning to chess, we had never had but one opinion—that the thing has never occured—yet, in the very proper remark of one of the committee, a "trial is not to test opinions, but to elucidate facts," and when these shall be fairly ascertained, we will abide by the results.

The following report in relation to the examination of the proofs, offered by Mr. Davison, has been made by the committee; and it will be seen that the committee have decided to make a trial, which it is hoped will result in a satisfactory decision on this long agitated question. B. P. J.

ROCHESTER, *August 24th*, 1857.

B. P. JOHNSON, Esq., *Secretary:*

The committee appointed to make an examination of the proofs of the transmutation of wheat into chess, have failed to find any absolute or reliable facts to sustain that presumption; and, although the exhibitor, Samuel Davison, Esq., of Greece, Monroe county, is a man in whom all confidence can be placed, and the proofs resting upon his representation of the manner by which it was produced, and an expectation of finding the attachment of the original wheat kernel to the chess stem, which was an entire failure, as the farinaceous portion of the berry was entirely decomposed, leaving only the chaff and bran wholly unattached.

The roots of the chess in no case were attached to the wheat stems or roots.

The committee consiting of Prof. C. Dewey, of Rochester, John J. Thomas, of Union Springs, Cayuga county, and L. B. Langworthy, of Greece, Monroe county, have resolved to institute the most stringent tests of this much mooted subject. Each individual to have an experiment in charge, and to follow the directions of Mr. Davison, after preparing the earth in the following manner:

A water-tight box, twelve to eighteen inches square, and six inches deep, is to be filled with any good *loamy wheat soil* which has been *boiled* with water *one hour*, to destroy all vegetable vital-

ity, when a given number of wheat grains are to be planted after some mathematical diagram, known only to the person trying the experiment, to guard against any possible outside interference by introducing the seeds of chess. After which they are to follow, implicitly, the directions of the proposer, and report to the State Society.

C. Dewey, J. J. Thomas, L. B. Langworthy, *Committee.*

REPORT ON THE CHESS EXPERIMENT.

To B. P. Johnson, *Secretary of the State Agricultural Society:*

Sir—At your request, in the summer of 1857, C. Dewey and L. B. Langworthy, of Greece, and J. J. Thomas, of Union Springs, consented to act as a committee on this subject.

Benjamin Hodge, Esq., of Buffalo, had offered a premium of one hundred dollars to any one who would give evidence, satisfactory to such committee, that he had grown chess on the same stalk and head of wheat, or had found wheat to be changed into chess in the natural course of growth.

Dr. Samuel Davison, of Greece, Monroe county, an intelligent and successful agriculturist, proposed to present this proof, provided his directions were followed. The committee agreed on the plan to be pursued to prevent any mistake or deception, which was acceded to by Dr. Davison, and which is detailed in Mr. Langworthy's account of his experiment.

The same experiment, in the same circumstances, was agreed to be tried by Dr. Davison, at his farm; by L. B. Langworthy, at his farm; by J. J. Thomas, Union Springs, and by C. Dewey, in his garden, in Rochester.

The wheat was sown in prepared soil, in September, 1857, and the plants were in full maturity in July, 1858, at these several places.

Mr. Langworthy's letter here follows:

To Prof. Dewey, chairman of the committee, to whom was referred the request of Dr. Samuel Davison, of Monroe county, to the State Society, that an experiment on the subject of the transmutation of *wheat into chess* might be instituted under their supervision, according to his directions. Prof. C. Dewey, J. J. Thomas and L. B. Langworthy having been designated as said committee, I proceed to state my proceedings in the premises:

The proposer, Dr. Samuel Davison, furnished each of the committee with two tin pans, six inches deep, and fourteen by eigh-

teen inches square, with a well at one corner, with a hole and plug to let off the superfluous water; two of which were filled with a *clay loam* earth, which was boiled in a caldron for two hours, to destroy all the germs of vegetation which it might contain. On the 15th of September, 1857, I commenced the experiment. One of the pans were planted after a *private diagram*, only known to myself, to detect any outside interference if attempted, with seventeen hills of four kernals each, bedded into the earth, but not covered, and the other with nine heads of wheat unshelled, planted in the same way; about one-half of the seeds planted vegetated.

Soon after it came up, and while in the first and second leaf, and so on till freezing weather, it was *crushed down* and *mutilated* by rubbing a piece of brick over the surface, and also by the foot; according to the written directions of the proposer. About the first of November, the pans were settled into the earth in my garden even with the general surface, and left without further interference during the winter months. About one-half of the plants winter killed; and soon after they commenced to vegetate in the spring, the shoots were hoisted and broken up, by inserting the end of a cane under them, and then left to the operation of nature and the elements, in imitation of the severe effects of frost on *heavy land* in field culture.

The result was, that nature, true to its instincts, produced about *thirty heads* of *pure bearded wheat*, and *nothing else*. The plan with winter barley and oats showed the same results.

I have followed, unscrupulously, the proposer's written directions, in every particular; which resulted so different from his own experiments, the previous year, which were exhibited to us, that I can only account for the discrepancy, by some unknown interference beyond the knowledge or suspicion of himself, who is a man intimately known to me as a person of the strictest integrity, and a sincere searcher after truth. He is now in feeble health, and probably will never be able to follow up his experiments on this much mooted subject.

Your obedient friend,

L. B. LANGWORTHY.

Greece, Monroe Co., *Sept.* 20, 1858.

Dr. Davison died of consumption some month or two after this date. C. D.

In relation to his own experiment, J. J. Thomas wrote me, September 3d, 1858: "I could not make the chess grow."

Dr. Davison informed me, as he was looking at the wheat growing in the tin pan, in the summer of 1858, in my yard, that the experiment at his farm *had failed to produce any chess.* He had himself trodden down the wheat plants in my pan in the fall of of 1857, to show me how the operation should be. The earth had been exposed, in each case, to all changes derived from the elements through the whole course, from the sowing of the seed to the maturity of the crop. I had twenty-five heads of wheat, but not an approximation to one seed of chess.

The precautions adopted by the committee were only two: 1. The boiling of the earth in water for two hours, till every seed in it should be destroyed; and 2. The growth of the wheat in a separate pan, that no seed should should send up a culm from earth below or around it.

The conclusion of the committee is, that in this form the experiment entirely failed to prove, in each of the four instances, that wheat can be transmuted into chess. The result will confirm those who maintain that the chess seed lies in the earth ready to vegetate.

Consider the change in the growth, if a wheat plant can be turned to chess. The head of wheat is short, thick, relatively close pointed, or, as it is called, a close *spike*; but the chess has no like form, but is a long and diffuse *panicle*, the little stems which bear the small and short separate heads of the seed, rising in clusters at several and separate points along the stem, the small heads bearing a very different number of seeds from the sessile and pikelets of the wheat head; add to this the difference between the seeds of wheat and chess, in their composition, matter and value. What a transmutation! the plant *not yielding seed after its kind.*

In the wheat growing districts of England, France, Germany, &c., who has ever heard of the opinion there that wheat is by nature's operation changed into chess?

Respectfully submitted.

C. DEWEY, *Chairman.*

NOTE.—In a previous experiment by Dr. Davison, 1856, '57, where there had been no precautions to obtain soil absolutely free from seeds, he had sown wheat, and there appeared, the next summer, abundance of chess growing with the wheat; there were more than fifty plants of each. Dr. Davison was satisfied that the experiment was not satisfactory, and ought not to be, in such circumstances. Yet, he was desired to open the earth and trace

each plant down into the soil, to ascertain whether the chess grew upon, or was connected with the wheat plants, except by proximity. He was fully satisfied that each wheat, and each chess plant, was entirely distinct from the other, and that their roots were in no case united; and that they originated from distinct seeds. Several gentlemen present at the examination, fully coincided in that conclusion.

Two years ago a little head of chess was shown me, apparently growing by its own stalk out of a large head of wheat. A careful examination showed that the stalk bearing the chess head, was only intertwined among the vessels of the wheat head, having no growing connection with it, but had been torn from its own chess plant. C. D.

STATISTICS.

A circular was issued to the several counties in the State, in August, 1858, in order to ascertain, as near as practicable, the amount of crops raised, the deficiencies, as compared with previous years, and the cause, as far as known; the extent of the ravages of the wheat midge; and whether drained lands had suffered less than undrained lands from wet or drought; the general condition of farming, as compared with former years.

We have received answers from twenty-four counties; and from four counties answers from two individuals in each county.

The average crop of winter wheat per acre, from twenty-one counties, is $13\frac{13}{100}$ bushels per acre.

Spring wheat.—$13\frac{2}{100}$ bushels per acre, from 24 counties.

Corn.—$40\frac{8}{100}$ bushels per acre, from 24 counties.

Rye.—16 bushels per acre, from 18 counties.

Barley.—20 bushels per acre, from 21 counties.

Oats.—24 bushels per acre, from 22 counties.

Buckwheat.—$15\frac{1}{2}$ bushels per acre, from 16 counties.

Flax.—But very little raised.

Potatoes.—104 bushels per acre, from 23 counties.

Peas.—$20\frac{4}{100}$ bushels per acre, from 17 counties.

Beans.—$19\frac{1}{2}$ bushels per acre, from 17 counties.

Hay.—Nearly $1\frac{1}{2}$ tons per acre, from 24 counties.

Fruit.—Generally a poor crop; almost an entire failure.

The winter wheat has been injured by the wheat midge and rust. In thirteen counties the midge has prevailed, and in four counties *rust* also. In five counties the wheat has not been affected. In

eight counties, crop above an average, and in fourteen, below the average crop. The Mediterranean wheat less affected than any other by the insect—so far as reported.

Spring wheat.—From reports from twenty-four counties, it appears that the average crop has been $13\frac{2}{100}$ bushels per acre—which is less than the average yield.

In fourteen counties the yield has been less than the average yield; and in ten counties, the average yield, or over. In five counties the crop was seriously injured by the wheat midge and rust.

Corn averaged $40\frac{8}{100}$ bushels per acre, which is the above the average yield; in twenty-one counties the crop has been above an average, and in three counties below. The grasshoppers have injured the crop in some sections.

Rye.—Eighteen counties report an average of sixteen bushels per acre. In eleven counties the yield has been above an average, and in five counties below. No disease has affected this crop.

Barley.—Twenty-one counties report the barley crop, and the average is twenty bushels per acre.

Fifteen counties report the crop below an average, and six counties average or above. This crop has suffered severely from insects, and disease, and from dry weather.

Oats.—Twenty-two counties report the oat crop, averaging twenty-six bushels per acre.

Eighteen counties report the crop as below the average, and four only as equal to the average.

This crop has been very seriously injured by the rust in eleven counties, and by the grasshopper in two counties.

Buckwheat.—Nineteen counties report on buckwheat; the crop averaging sixteen bushels per acre; but much below the average, owing mainly to drought, and in a few cases to grasshoppers, whose depredations have been such as to attract attention.

Potatoes.—Twenty-four counties have reported on potatoes; crop averaging 104 bushels per acre; and in seventeen counties the crop reported as above the average of the last few years, since the disease has been so prevalent. Only five counties report the crop as diseased generally. Four counties report as decidedly good. Eight as very little diseased. We trust that these gladdening prospects will be still more general the coming year.

Peas average twenty bushels, and beans nineteen and a half per acre; are not very generally cultivated as farm crops, but give fair returns, when proper attention is given to their culture.

Hay.—The crop of hay averaging about one and a half tons per acre; in seventeen counties the crop reported as above the average.

Fruit.—The returns show that the crop of fruit has been almost an entire failure throughout the State.

Drained lands.—Twenty counties in which draining more or less has been introduced, report that crops better in quantity and quality are raised, and less affected by rust or insects; such, we have no doubt, will be the testimony in every town in the State, when the experiment has been carefully tried.

Wheat midge.—From several of the counties, there are reports that the wheat midge is disappearing; but whether from the want of the wheat to operate upon, or from its passing away to other localities, it is not stated.

Farming improving.—It is distinctly answered in twenty-three counties, that there is a decided improvement in farming. We give a few of the answers: "Constantly improving." "Report progress full twenty-five per cent better than former years. Improving our lands by draining, our stock by better care, and improved breeds." "More attention, and better tools, and better husbandry than formerly."

"There is a decided improvement; very much improved for the last few years in regard to stock and farming generally."

"Farm lands are improving very much through the county, and have been much improved within the last three years."

"There is gradual improvement in farming, made very apparent in increased attention to the application of manures, and cleanliness in general."

"Farmers are improving their farms and stocks materially within the past five years; deep plowing is new to most of our farmers; hence the failure of many crops."

"There is very much improvement in all the branches of farming. The land is *better* cultivated and drained; *labor saving implements* are introduced; *manure* is better *saved*, and better *applied;* more attention to the improvement of stock."

"We have a healthy awakening on the subject of improvements in agriculture, perhaps more than at any former period; necessity is driving our farmers to adopt a better system of farming than formerly."

"Visibly improving." "Better and constantly improving." "The standard of farming is higher." "There is reform in every branch of farming."

We are gratified, that in these counties representing every section of our state, there is such an uniform testimony as to the real progress of agriculture.

We give the reports in full, and although not such reports as would have been secured by the assessors of the several towns, still we believe every farmer will be glad that we have secured as much as we have, and that another year will witness an effort to obtain from the legislature, an act to collect annually, the agricultural statistics of each town. A bill was introduced for this purpose by the agricultural committee of the House of Assembly, but failed in the multitude of business which accumulated during the session.

It is hoped that a bill will be passed for this purpose, as it cannot be doubted that great good will result from it. J.

REPORT AND ANSWERS TO CIRCULAR.

STATE AGRICULTURAL ROOMS,
ALBANY, *August*, 1858.

SIR—I am desirous of ascertaining, as far as practicable, the state of Agriculture in your county, the present year, and desire you to answer the annexed questions, and be particular in regard to the deficiencies (if any) of the usual crops, and the causes of the same, as far as may be known. Please return the answers on the annexed schedule, as soon as they can be satisfactorily ascertained.

Respectfully yours,

B. P. JOHNSON, *Secretary.*

ALBANY COUNTY.

LEVI SHAW, *Rensselaerville.**

1. Winter Wheat.—Twelve bushels only; below average.
2. Spring Wheat.—Eight bushels; below average; no insect.
3. Indian Corn.—Thirty-five bushels; more than average and better.
4. Rye.—Sixteeen bushels.
5. Barley.—Very light crop.
6. Oats.—Thirty bushels; weighed very heavy.
7. Buckwheat, good; weighed fifty-two pounds per bushel.
8. Potatoes.—Eighty bushels; quality good.
9. Peas.—Twenty-eight bushels; quality good.
10. Beans.—Fifteen bushels; very good compared with usual yield.
11. Hay.—One and one-half tons per acre.
12. Fruit.—Light crop.
13. *Q.* To what extent (if any,) has wheat been affected by the midge? Have any varieties escaped the ravages of the insect? *A.* The wheat midge we think is passing away, and we shall probably sow more winter wheat.
14. *Q.* Have drained lands been less injuriously affected than undrained lands, by wet or drought? *A.* Not much drained lands; plow land very deep every second year with good advantage.

* We regret to learn of the death of Colonel Shaw, a most estimable man, a few days after this report was prepared.

15. *Q.* What is the general condition of farming in your county, as compared with former years? *A.* Constantly improving, and our good crops and good markets give us many advantages. The season has been as good a one as we have had in twenty years; ten acres of buckwheat gave me 300 bushels—fifty-two pounds to the bushel. Corn on my farm, fifty-five bushels.

ALLEGANY COUNTY.

WILLIAM WILSON, *President Agricultural Society;* A. B. HULL, *Secretary, Angelica.*

1. Winter Wheat.—Seven bushels, medium quality; below average; midge and rust.

2. Spring Wheat.—Ten bushels, medium quality; below average; midge and rust.

3. Corn.—Thirty-five bushels, good quality; yield, as good as usual.

4. Rye.—Not much raised and light yield, less than usual.

5. Barley.—Fifteen bushels raised and light yield, less than usual.

6. Oats.—Nearly a failure; badly rusted; grain light and altogether the poorest crop ever known in the county.

7. Buckwheat.—Twenty bushels; below the average crop; no disease.

8. Potatoes.—Eighty-five bushels; quality good; average crop, and little or no disease.

9. Peas.—Fifteen bushels of good quality, but less than average crop.

10. Beans.—No report.

11. Hay.—One ton of good quality on flat lands; yield, good but light on uplands, quality good.

12. Fruit.—Some orchards yielded well, but much below average yield generally, and quality inferior.

13. All varieties of white wheat suffered from the midge; Mediterranean wheat escaped; hill lands suffered the least.

14. Undrained lands, less affected by wet and drought.

15. General condition of farming improving.

CAYUGA COUNTY.

H. S. DUNNINGS, *Vice-President Agricultural Society.*

1. Winter Wheat.—Twenty bushels; superior quality and quantity; slightly affected by insects; a number of crops averaged thirty bushels per acre.

2. Spring Wheat.—Fifteen bushels, good; above average; slightly affected by midge.

3. Corn.—Fifty bushels; best crop in five years; drained lands produced the best crops.

4. Rye.—Very little raised in the county.

5. Barley.—Fifteen to twenty bushels; on the decline; injured seriously by *maggot* in the joint.

6. Oats—Twenty-five bushels, not as good as usual; many crops nearly destroyed by grasshoppers.

7. Buckwheat.—Twenty bushels, not as good as usual; injured by the grasshoppers.

8. Potatoes.—120 bushels; more than usual; quality fine; affected by disease somewhat on low grounds.

9. Peas.—Twenty-five bushels; average crop.

10. Beans.—Not much raised as a field crop.

11. Hay.—One and one-half tons per acre; quality good but deficient in quantity; affected by the grasshoppers.

12. Fruit.—Almost a failure in the county; about 3000 bushels sold.

13. White wheat considerably injured by insects; Mediterranean but slightly.

14. Drained lands in all instances produce the best crops in quality and quantity.

15. General condition of farming improving, full twenty-five per cent better than formerly; lands improved by draining, and stock, by improved breeds and better care.

R. Hale, *Aurora, Cayuga.*

Mr. Hale says he is unprepared for a general report, but gives so far as he has information of the crops. He writes that he will endeavor hereafter to give more full and reliable accounts.

2. Spring Wheat.—Of fine quality, but that the sowing of mixed seed and bad cultivation causes the crop to ripen unevenly.

4. Rye.—Twenty bushels winter rye on his own farm; none other raised in his vicinity.

6. Oats.—Thirty bushels—three-quarters of usual crop; dry weather affected the late sowed. That which was sowed early got a good spring growth before the drought commenced, and where properly tilled was a good crop.

8. Potatoes.—His own crop averaged 205 to 230 bushels per acre, free from rot. The dry sand knolls suffered severely from drought, and unless well managed the potatoes were immature.

10. Beans.—Beans like potatoes did best in rich low lands, such as in ordinary seasons were too wet, provided the lands were sufficiently loamy to prevent baking.

12. Fruit.—A fair crop as to quantity, but excessively infested with insects and inclined to premature ripening. The curculio is in everything, even in hard pears and rough peaches.

CHAUTAUQUE COUNTY.

A. S. Moss, *President Agricultural Society, Fredonia.*

1. Winter Wheat.—Twelve bushels per acre; fair in quality, but three or four bushels below an average. The wheat midge has at intervals caused damage, but not to a great extent. There is but little land that is favorable for winter wheat.

2. Spring Wheat.—Thirteen bushels per acre, of good quality; not the usual average. The rust or blight sometimes affects the spring wheat.

3. Indian Corn.—Twenty-five bushels per acre of good quality; hardly an average crop. Corn has in many fields been a splendid crop, but much of it has been injured by the grasshoppers.

4. Rye.—Is but little grown in this county.

5. Barley.—Of fair quality—twenty bushels per acre; less than the average crop; is not extensively cultivated.

6. Oats.—Very poor quality—ten bushels per acre—not half a crop; blighted or rusted; usually grown very extensively and successfully.

7. Buckwheat.—But little grown.

8. Potatoes.—Eighty bushels per acre on an average; of fair quality; the rot not very bad this year; potatoes are grown considerably in the county, and do well generally, the disease being the only difficulty.

9. Peas.—An average crop of eighteen bushels per acre; not very extensively grown, but their cultivation is on the increase.

10. Beans.—Of good quality; eighteen bushels per acre, but not much cultivated.

11. Hay.—Of good quality; one ton per acre; not quite an average crop.

12. Fruit.—The wet, cold spring, it is believed, was the cause of the destruction of the fruit, and but very little raised, and that of inferior quality.

13. The wheat midge has not been very general; white wheat mostly grown.

14. Undrained lands have been most injured by wet and drought.

15. More attention is being given to farming; better tools and better husbandry than formerly.

CHEMUNG COUNTY.

J. O. Scudder, *Secretary Agricultural Society.*

1. Winter Wheat.—Average eight bushels per acre; better than for three or four years past. The wheat midge has nearly destroyed the crop for a few years. There is a fair prospect of growing wheat again as the midge appears to be passing away.

2. Spring Wheat.—Average nine and one-half bushels per acre; better than for a few years past; affected by the midge as much as the winter wheat.

3. Corn.—Thirty-one bushels per acre well ripened, and much better crop than the past two years.

4. Rye.—Fourteen bushels per acre, and above the average of a few years.

5. Barley.—Twenty bushels; better than last year but not a full crop.

6. Oats.—Thirty bushels; light and less than an average; affected by the drought.

7. Buckwheat.—Mostly a failure, owing to drought and early frost in the month of August.

8. Potatoes.—100 bushels per acre; more than the usual average; very little affected by the rot.

9. Peas.—Fifteen bushels per acre.

10. Beans.—An average crop of thirty bushels.

11. Hay.—One ton or a little less, and lighter than last year. The yield on alluvial soils was very large, but on hill lands unusually light.

12. Fruit.—Apples very small and poor.

13. The low lands have been most affected by the wheat midge. Mediterranean wheat seems to escape the midge the best with us and yields very fair.

15. There is, certainly, a marked improvement in the general condition of farming in this county.

Tobacco has been cultivated in this county to a considerable extent; 200 acres under culture, yielding 1200 lbs. per acre; quality better than last year, but less planted, owing to dry weather.

CHENANGO COUNTY.

JONATHAN WELLS, *Secretary Agricultural Society, Norwich.*

1. Winter Wheat.—Seven to eight bushels per acre, less than the average yield; has been affected by the wheat midge for which we know no remedy; but little sown in the county.

2. Spring Wheat.—Twelve bushels per acre; one-eighth short of usual yield; has been affected by midge; late sown was injured less than early sown.

3. Indian Corn.—Forty bushels per acre; one-quarter better than usual yield; no disease. Corn was remarkably sound and good in this county—never better.

4. Rye.—Thirteen bushels per acre; average yield; no disease; very little sown or raised.

5. Barley.—Twenty bushels per acre; one-quarter short of usual yield; affected by the rust; lime the best remedy.

6. Oats.—Twenty bushels per acre; affected by rust or blight; do not know of any remedy. This crop was badly injured in this county and is not less than one-quarter short.

7. Buckwheat.—Ten bushels per acre; one-half less than usual yield; affected by drought.

8. Potatoes.—150 bushels per acre; seven-eighths better crop than last year; no disease to amount to much. Potatoes, owing to the dry season, were free from disease and a good crop.

9. Peas.—Fifteen bushels per acre; average yield; not many sown.

10. Beans.—Twenty-five bushels per acre; average yield; no disease; not largely cultivated.

11. Hay.—One ton per acre; average crop; some land slightly injured by drought.

12. Fruit.—Not quite as good in quality and quantity as usual; affected by the worm; know no remedy. The prospect in the early part of the season was good for a large crop, but was eaten by worms, and fell off before coming to maturity.

13. I do not know that one variety has escaped the ravages of the insect more than the other, only late sown, in some instances, has been injured less than earlier sown. This may not be proof against the insect.

14. As far as I am posted, they are much less injured by droughts and wet. I am sorry to say that draining has not received the attention in this county that it ought to.

15. The general condition of farming in this county is good and encouraging. Our farmers are almost all engaged in dairies—butter and cheese making—it is the principle business of the most of them, and their improvement is very great in this line. You will not often find better butter than is produced here.

COLUMBIA COUNTY.

ABRAHAM ASHLEY, *Secretary Agricultural Society, Chatham Four Corners.*

1. Winter Wheat.—None raised in the county to my knowledge.

2. Spring Wheat.—Twenty bushels per acre; about the average yield; no insect affecting wheat.

3. Indian Corn.—Thirty-five bushels per acre; above the average yield.

4. Rye.—Eighteen bushels per acre; about the usual yield.

5. Barley.—Twenty bushels per acre; usual yield.

6. Oats.—Thirty bushels per acre; less than usual yield; drought at the time of heading.

7. Buckwheat.—Twenty-five bushels per acre; dry hot weather prevented its filling.

8. Potatoes.—Fifty bushels per acre; good quality; yield much better than usual; rot about disappeared; Jenny Linds do the best The president, P. G. Collins, planted one acre and raised 200 bushels; no rot troubled them.

9. Peas.—Not many raised in this county.

10. Beans.—Not extensively raised.

11. Hay.—One and one-half tons per acre; quality good; less than usual crop; drought and grubs affected it; natural meadows most affected.

12. Fruit.—Very little and very poor; no comparison to usual yield; caterpillars affected the fruit. The worms have nearly destroyed the trees for the last two years.

13. No wheat has been affected by the midge; all varieties of spring wheat have escaped.

14. Drained lands have been less affected than undrained.

15. There appears to be an increased interest for improvement in farming, and, I think, the general condition is better than formerly.

DUTCHESS COUNTY.

PETER SLEIGHT, *President Dutchess County Agricultural Society.*

1. Winter Wheat.—Fifteen to twenty bushels per acre; better than usual yield; midge trifling.

2. Spring Wheat.—Twelve to fifteen bushels per acre; usual yield; not much raised.

3. Indian Corn.—Thirty-five to fifty bushels; better than usual yield; highest reports to our society, seventy-nine to eighty-one bushels per acre.

4. Rye.—From eighteen to twenty bushels; a good average; large crop.

5. Barley.—But very little raised.

6. Oats.—Forty-six to sixty bushels; usual yield; some rust; much raised.

7. Buckwheat.—Crop light and much injured by grasshoppers.

8. Potatoes.—But few raised and much affected by disease.

11. Hay.—One to one and one-half tons per acre; short of an average; somewhat injured by grasshoppers.

12. Fruit.—Apples, a good yield; most other fruit short.

15. The general condition of our county in agriculture is improving.

FULTON AND HAMILTON COUNTIES.

ISAIAH YANNEY, *Secretary Fulton and Hamilton County Agricultural Society.*

1. Winter Wheat.—Twenty bushels per acre; quality good; full yield; slightly affected by the insect; not a large quantity sown.

2. Spring Wheat. — One-quarter less than usual yield; somewhat affected by midge; must sow late to avoid the midge.

3. Indian Corn.—Twenty-five to thirty bushels per acre; quality very fine; full yield; some locations wire worm; many fields average from fifty to sixty bushels per acre.

4. Rye.—About twelve bushels per acre; quality good; usual yield, some fields twenty-five bushels per acre, in favorable localities.

5. Barley.—Fifteen to eighteen bushels per acre; half yield; affected by wireworm; cause unknown; usual average from thirty to thirty-five bushels per acre.

6. Oats.—Thirty bushels per acre; about usual average; some pieces slightly rusted.

7. Buckwheat.—Ten to twelve bushels per acre; about one-third of a crop; no particular disease; early frosts injuring this crop very materially.

8. Potatoes.—About 100 bushels per acre; quality fine; disease somewhat prevented by planting on dry, sandy soil; this year a finer crop than in many previous years.

9. Peas.—About eighteen bushels per acre; a fair average yield; no disease, except bug; remedy, sow late; not as many peas sown as in former years.

10. Beans.—About twenty bushels per acre; quality very fine; full yield; no disease; quite profitable grown with corn.

11. Hay.—One and a half tons per acre; good yield; not as bulky crop as some years.

12. Fruit.—About one-eighth of a crop; trees somewhat affected by blight; much fruit destroyed by cold, rainy weather, during setting of fruit.

13. Wheat not materially affected by the midge; no variety entirely exempt.

14. Drained lands are decidedly less injured than undrained lands by wet or drouth.

15. There is a decided improvement in farming in these counties; and, for the last few years, very much improved stock has been introduced.

GENESEE COUNTY.

N. K. Cone, *Cor. Sec., Genesee Co. Agricultural Society.*

1. Winter wheat.—Eight bushels per acre; less by ten bushels than usual yield; affected by wheat midge.

2. Spring wheat.—Ten bushels per acre; eight bushels less than usual yield; affected by midge; late sown escapes the insect.

3. Indian corn.—Fifty bushels per acre; increase, ten bushels over usual yield; capital crop.

4. Rye.—Twenty bushels per acre; not much sown before; the crop is about the first raised.

5. Barley.—Twenty bushels per acre; less by ten bushels than usual yield; winter barley does well; spring barley injured by midge.

6. Oats.—Thirty bushels per acre; twenty bushels less than usual yield; injured by drouth and flood.

7. Buckwheat.—Very little sown.

8. Potatoes.—One hundred bushels per acre; usual yield; affected by rot.

10. Beans.—Twenty-five bushels per acre; average yield; no disease.

11. Hay.—One and three-fourth tons per acre; above average.

12. Fruit.—About one-fourth crop.

13. The best varieties injured by midge; Mediterranean and Golden Drop escaped; good crops.

14. Early sowing is an advantage, and grounds underdrained less liable than cold, wet ground.

15. The lands in this county are in a high state of cultivation, but the general crisis in the fall of 1857, affected the farmers and all other classes, which, added to the destruction of wheat, makes hard times.

GREENE COUNTY.

H. L. Day.

1. Winter wheat.—Twenty bushels per acre; not a great quantity raised, but better than usual.

2. Spring wheat.—Fifteen bushels per acre; better than usual.

3. Indian corn.—Forty bushels per acre; good as usual.
4. Rye.—Fifteen bushels per acre; better than usual.
5. Barley.—Twenty bushels per acre; usual yield.
6. Oats.—Thirty bushels per acre; not usual yield.
7. Buckwheat.—Twenty bushels per acre; not as good as usual.
8. Potatoes.—150 bushels per acre; better yield than 1857.
9. Peas.—Forty bushels per acre; as good as usual.
10. Beans.—Fifteen bushels per acre; usual yield.
11. Hay.—One and one-half tons per acre; better crop than 1857.
12. Fruit.—Poor crop, full one-half less than last year.
15. Farm lands are improving very much through the county, and have been much improved within the last three years.

JEFFERSON COUNTY.

W. Ives.

1. Winter wheat.—Thirteen bushels per acre; fair; three bushels less than usual yield; affected by midge.

2. Spring wheat.—Thirteen bushels per acre; medium quality; three bushels less than usual yield; affected by midge and rust.

3. Indian corn.—Thirty-five bushels per acre; quality good; five bushels less than usual yield; affected by excess of moisture early in the season, and drought in the middle and latter part.

4. Rye.—Twelve bushels per acre; three bushels less than usual yield.

5. Barley.—Fifteen bushels per acre; quality medium; five bushels less than usual yield; affected by excess of early rains.

7. Oats.—Twenty bushels per acre; quality inferior; excess of moisture and drought.

8. Potatoes.—100 bushels per acre; fifty bushels less than usual yield.

9. Peas.—Twelve bushels per acre; six bushels less than ordinary yield; unusual variations of temperature and moisture.

11. Hay.—One and one-fourth tons per acre; average yield.

12. Fruit.—Apples the leading and most important of the fruits cultivated; proved less in yield than for many years past.

13. The extent of damage by the midge is not easily estimated; I do not know that any variety has escaped.

14. I have no correct data to draw from, but have no doubt drained lands bear the extremes best.

15. There is gradual improvement made in farming, very apparent, in increased attention to the application of manures and cleanliness in general.

ONEIDA COUNTY.

S. A. Bunce.

1. Winter wheat.—Ten bushels per acre; should think less than usual yield; affected by rust and midge. We raise very little wheat of any kind in this county.

2. Spring wheat.—Twelve bushels per acre; usual yield; some pieces were affected same as winter wheat; late sown was best.

3. Indian corn.—Thirty bushels per acre; usual yield; no insect.

4. Rye.—Very little raised.

5. Barley.—Miserably poor, almost a failure; seemed to be affected by an insect in the stalk.

6. Oats.—Twenty bushels per acre; less than usual yield; affected by rust. The crop generally, especially late sown, very light.

7. Buckwheat.—Ten bushels per acre; less by one-half than usual yield; affected by blight, supposed to be occasioned by the dry weather.

8. Potatoes.—200 bushels per acre; much better than usual; very little, if any, rot.

9. Peas.—But few raised.

10. Beans.—Twelve bushels per acre; rather less than usual yield.

11. Hay.—One and one-half tons per acre; usual crop.

12. Fruit.—A failure; but few farmers raised a surplus.

13. Mediterranean winter wheat is least affected by the insect.

14. Drained lands have been less injuriously affected by wet or drought than undrained lands.

15. We raise but little grain, but graze more.

OSWEGO COUNTY.

D. W. C. Peck.

1. Winter Wheat.—Twelve bushels per acre; average crop; no insect; not much raised.

2. Spring Wheat.—Ten bushels per acre; two-thirds of a crop; affected by rust and grasshoppers.

3. Indian Corn.—Thirty bushels; good quality; affected by grasshoppers. Some fields did not do much from lateness of season.

4. Rye.—Twelve bushels per acre; usual crop; not extensively raised.

5. Barley.—Twenty bushels per acre; season not good for barley and very little sown.

6. Oats.—Twenty bushels per acre; usual crop much greater; rusted badly; very light in weight per bushel.

7. Buckwheat.—Almost an entire failure on account of grasshoppers.

8. Potatoes.—150 bushels per acre, good quality; better yield than usual; not affected by rot.

9. Peas.—Twenty-five bushels per acre; very few grown.

10. Beans.—Twenty bushels per acre; not generally cultivated.

11. Hay.—One ton per acre; a little below usual crop; affected by grasshoppers.

12. Fruit.—Almost a failure—not one-quarter of a crop.

13. Wheat not much affected by midge; China tea wheat not injured by insects.

14. Draining not practiced as much as it should be, but with success when practiced.

15. Farming is certainly in an improving condition; lands are reclaimed, fences rebuilt, better and deeper plowing practiced, machinery coming into use to some extent. Probably no section in the State was more infested with grasshoppers than this. A large proportion of the corn fodder was fed out before the middle of October and in many instances hay was fed.

OTSEGO COUNTY.

ALFRED CLARKE, *President Otsego County Agricultural Society.*

1. Winter Wheat.—Fifteen bushels per acre; about the usual yield. The quantity of winter wheat raised in our county is small, say from five to ten thousand bushels.

2. Spring Wheat.—Thirteen bushels per acre; usual yield; there may be double the spring wheat raised over the winter wheat.

3. Indian Corn.—Thirty-five bushels per acre; rather better than usual yield, one of our largest crops. The kind mostly planted—eight rowed yellow.

4. Rye.—Eighteen bushels per acre; good yield.

5. Barley.—Very little raised in the county.

6. Oats.—About seventeen bushels per acre; very light. Another of our largest crops but the yield this year light, on account of the wet, particularly those sown late; some early oats very good, thirty-six pounds per bushel.

7. Buckwheat.—Twenty-two bushels per acre; fair yield; a large crop in our county.

8. Potatoes.—Fifty bushels per acre; better yield than last year; affected by rot but not as badly as in 1857; widely planted with us. Some very fine specimens at county fair of Prince Alberts and Garnet Chili.

9. Peas.—Twenty bushels per acre; fair yield.

10. Beans.—eighteen bushels per acre; small yield.

11. Hay.—One and one-quarter tons per acre; very good yield; our main crop.

12. Fruit.—Very light; about as usual; main crop—apples.

13. Some pieces of winter wheat have been nearly destroyed by the midge, and others scarcely affected.

14. On drained lands, of which we have but a very small proportion, the increase in grass and corn has been about 33⅓ per cent per acre.

15. In some parts of our county there is in the last ten years, quite a perceptible improvement in the condition of our farms; but still there is abundance of room for further improvement in lands, houses, barns, fences, orchards and gardens.

SPRINGFIELD, *Jan.* 6, 1859.

B. P. JOHNSON, Esq.:

Dear Sir—I return you the schedule, most imperfectly done, as the small amount of information to be derived from it is truly lamentable. Getting at anything like correct answers to most of the questions, is the merest

guessing. For instance, I have asked some of our most intelligent farmers what they supposed was the total crop for 1858, of Indian corn in the county, and the guessing runs from three to five hundred thousand bushels. In winter wheat, one farmer sowed twelve bushels on seven and a half acres—product sixteen and a half bushels per acre, drilled in, badly affected by midge—white flint. Another neighbor adjoining, had, on a small piece of some three acres, nearly twenty-seven bushels per acre, and not touched by the midge, drilled in. No cause assigned for the escape of his crop from the attack. Underdraining has, as yet, been done but by very few, and on a comparatively small scale, but from the beneficial effect produced, the desire to enter upon it is daily increasing. I have merely made this simple statement in order to make up somewhat for the barrenness of the information in the schedule. Yours truly,

ALFRED CLARKE.

QUEENS COUNTY.

JOHN HAROLD, *Secretary Ag. Society.*

1. Winter wheat.—Eighteen bushels per acre; quality middling; under the average; affected by midge and rust to some extent; soaking in brine, and rolling in lime practiced to kill the midge; very little winter wheat, except Mediterranean, sowed.

2. Spring wheat.—Twenty bushels per acre; less than last year; Canada and Tea spring wheat the only varieties sown; the tea wheat best; only few sow spring wheat.

3. Indian corn.—About forty bushels per acre; quality good; less than usual yield.

4. Rye.—Twelve bushels per acre; good quality; less than usual yield.

5. Barley.—About fifteen bushels per acre; very little barley sown.

6. Oats.—Twenty bushels per acre—light, 28 pounds to the bushel; less than average yield; hot and dry weather prevented good growth.

7. Buckwheat.—Cannot ascertain the average; a poor crop.

8. Potatoes.—Sixty bushels per acre; less than usual yield; very little rot this year; sells at New York by the load, at 6s. per bushel.

11. Hay.—About one and one-half tons per acre; very good quality; average yield; sells at New York by the load of loose hay at seventy-five cents per hundred weight.

12. Fruit.—A general failure.

13. Wheat only slightly affected by midge; no variety escapes the ravages of the insect.

14. On the south side of Queens county, the land has a gravel subsoil, and is therefore naturally drained. On the heavier lands draining has been productive.

15. Farming very much improved; more is raised on one acre now, than a few years since on three; the raising of market truck has greatly increased, and is profitable.

ST. LAWRENCE COUNTY.

L. E. B. WINSLOW, *Secretary St. Lawrence Co. Agricultural Society.*

1. Winter wheat.—Fifteen bushels per acre; usual yield twenty-five bushels; very little raised.

2. Spring wheat.—Twelve bushels per acre; usual yield twenty.

3. Indian corn.—Fifty bushels per acre; usual yield forty.

4. Rye.—Twelve bushels per acre; usual yield twenty-five.

5. Barley.—Twenty-five bushels per acre; full average yield.

6. Oats.—Fifteen to twenty-five bushels per acre; usual yield fifty.

7. Buckwheat.—Twenty bushels per acre; usual yield.

8. Potatoes.—175 bushels per acre.

9. Peas.—Fifteen to twenty-five bushels per acre.

10. Beans.—Thirty bushels per acre.

11. Hay.—One and one-half tons per acre.

12. Fruit in this section of county not usual yield.

14. I think drained lands are much less injured by wet or drought than undrained; but opportunities are limited in this county.

15. General condition of farming improved; but the spirit of improvement, though active now, has but lately sprung up. More lands will be drained in this county this year, than have been in all former years.

Remarks.—The partial failure of wheat, rye, oats and fruit, in this county, I believe to be mainly attributable to excess of rain upon undrained lands, causing mildew and rust. Wheat was somewhat injured by midge, but not extensively.

CHARLES SHEPARD, *Ogdensburgh.*

1. Winter wheat.—Fifteen to twenty-five bushels per acre, "Souls';" better than for years; the midge have nearly all left. All the winter wheat raised, has been on ground perfectly drained, and in small patches; one piece yielded forty bushels per acre.

2. Spring wheat.—About fifteen bushels; two-thirds usual yield; club wheat rusted; Scotch and Chinese good. We have no lands of any amount underdrained, which was, no doubt, the cause of the light crop for 1858.

3. Indian corn.—There were some good crops; probably forty bushels is an average; of the amount planted the crop was full an average; the wet season increased the amount of fodder and lessened the corn. The varieties were King Philip and Yellow Dutton.

4. Rye.—Winter rye was sown in small quantities; the average twenty bushels per acre; I know of no disease that affected rye. We raise no rye but for distilling purposes, which is the common black.

5. Barley.—This crop has been fair upon uplands; twenty-five to forty-five bushels per acre about the usual yield; there seems to be no disease affecting barley. The two-rowed is raised for pearl barley, and the four-rowed for malt.

6. Oats.—This crop was a failure, about ten bushels per acre; not more than one-third of a crop; rust was the principal difficulty with oats. Our

oats are generally sown on wet lands—they are very light, not weighing over twenty-five pounds.

7. Buckwheat.—This crop was light for this section; in 1857 it was cut off by frost; don't know of any disease; each farmer raises his own, but very little to sell.

8. Potatoes.—There was a large crop planted, but not more than half a crop harvested; one-half usual crop. We find the early varieties succeed the best; the rot commences 15th of August. All potatoes planted early escaped the rot; the Manly, Junes and Peach blows, least affected.

9. Peas.—Fifteen bushels per acre; about one-half crop. Our peas were very wormy; the Early June and Black-eyed Marrowfat succeed best.

10. Beans.—They podded well, but blasted with the wet; about one-third crop. I know of no remedy except underdraining. Our soil is generally too strong for beans; but few planted.

11. Hay.—The cold, backward spring ruined our hay crop; about two-thirds crop on upland, and less on lowlands.

12. Fruit.—Our fruit was generally good; one-third more than usual crop; the want of care the only disease. Our apples and plums were good; other fruits fair.

13. The midge have left this county, we hope, for good; we raise mostly spring wheat; the Fife wheat never rusts.

14. Our wet undrained lands have suffered with the wet season.

15. Farmers are improving their farms and stock materially within the past five years; deep plowing is new to most of our farmers, hence the failure of many crops.

SCHUYLER COUNTY.

JOHN WOODWARD, *Chairman of Committee Schuyler Co. Ag. Society.*

1. Winter wheat.—Twelve bushels per acre; medium quality; little more than half crop; affected by midge; early maturing the only remedy known; the Mediterranean variety not so much injured.

2. Spring wheat.—Ten bushels per acre; middling; about two-thirds usual yield; affected by midge; only remedy early or late sowing; "China tea" and "Fife" least injured.

3. Indian corn.—Forty-five bushels (shelled) per acre; thirty bushels is usual crop; some crops as high as seventy-five bushels shelled corn per acre.

4. Rye.—Fifteen bushels per acre; very good; usual yield; some crops yielded over twenty bushels per acre.

5. Barley.—Fifteen bushels per acre; light in weight; about one-half the usual yield; affected by sudden change from hot to dry weather; the poorest yield ever known in the county.

6. Oats.—Twenty bushels per acre; very light in weight; less than half a crop; early sown yielded pretty well.

7. Buckwheat.—Fifteen bushels per acre; quality fair; about three-fifths of usual yield; some crops good, others very light.

8. Potatoes.—100 bushels per acre; quality fair; about the same for some years; slightly affected with rot. Formerly, 300 to 400 bushels per acre was raised.

9. Peas.—Sixteen bushels per acre; quality good; but few are raised in this county.

10. Beans.—Twenty bushels per acre; quality good; average yield; but little attention has been paid to this crop.

11. Hay.—Two and a half tons per acre; excellent; one-third more than usual yield. Hay was secured in fine order.

12. Fruit.—Yield light; quality medium; about one-half the usual crop. Cold weather in the spring injured the blossoms. Apples much affected with apple worm at the core.

13. The wheat crop is reduced at least one-half by midge; "Mediterranean" and "Black Tea" nearly escaped.

14. Drained lands are much less injuriously affected than undrained lands, by wet or drought. There is not a doubt in regard to it.

15. There is very much improvement in all the branches of farming; the land better cultivated and drained; labor saving implements are introduced, and manure is better saved, and better applied than formerly. There is also beginning to be more attention to the improvement of all kinds of stock. I think the spirit of improvement has much increased since the establishment of our county Agricultural Society. The within report must necessarily be somewhat imperfect; but it is as nearly correct in the estimates as the committee (appointed by our county Agricultural Society), were able to make them, from the information obtained from the several towns in the county of Schuyler. All which is respectfully submitted.

STEUBEN COUNTY.

REUBEN ROBIE, *Treas. Steuben Co. Ag. Society.*

1. Winter wheat.—Eight bushels per acre; poor; half crop; affected by midge and rust.

2. Spring Wheat.—Twelve bushels per acre; good quality; usual yield; affected by midge and rust.

3. Indian corn.—Forty bushels per acre; better than average.

4. Rye.—Fifteen bushels per acre; average yield; affected by midge.

5. Barley.—Twenty bushels per acre; lighter than usual; affected by midge and dry weather.

6. Oats.—Twenty bushels per acre; poor; half crop; affected by rust.

7. Buckwheat.—Twelve bushels per acre; half crop; affected by frost.

8. Potatoes.—100 bushels per acre; good quality; fair yield.

9. Peas.—Thirty bushels per acre; good; usual yield.

10. Beans.—Twenty bushels per acre; good; usual yield.

11. Hay.—One and a half tons per acre; light; about three-fourths crop; affected by wire worm.

12. Fruit.—One-fourth crop.

13. Wheat was very generally affected by the midge; none entirely escaped the ravages of the insect. Fife and Mediterranean escaped more than other varieties.

14. Drained lands are twenty per cent less injuriously affected by wet or drought than undrained lands.

15. Farming is advancing steadily and surely.

TIOGA COUNTY.

R. HOWELL, *Nichols.*

1. Winter Wheat.—From twelve to sixteen bushels per acre; quality good; little more than the usual yield; affected by midge and rust on straw; no remedy for midge but to sow early.

2. Spring Wheat.—Yield, sixteen bushels per acre, very good; usual yield; no disease of any amount. In order to escape the midge sow May 15th.

3. Indian Corn.—Yield, thirty-five bushels per acre, very fine; one-fifth better than usual; no disease affecting it; when first planted the enemy was the cut worm.

4. Rye.—Eighteen bushels per acre; quality good; full an average; no disease; more sown than formerly.

5. Barley.—About thirty bushels per acre; quality good; very little raised in the county; barley some years infested by midge.

6. Oats.—From twenty to twenty-five bushels per acre; early sown, good; about half a crop; affected by rust and grasshoppers; some late sown fields not worth cutting.

7. Buckwheat.—Ten to twelve bushels per acre; quite good; one-third of a crop; affected by grasshoppers and hot dry weather.

8. Potatoes.—100 bushels or over per acre; very fine; twice the amount of last year; hardly any disease; very mealy.

9. Peas.—But little raised; infested generally by gray bug.

10. Beans.—Raised generally in small patches; usual yield and very fine; very fine in south part of county; in north part injured by grasshoppers.

11. Hay.—One and one-quarter tons per acre; generally good; rather above the average of 1857; injured by grasshoppers to some extent.

12. Fruit.—Yield quite large—as much again as last year; disease, a variety of insect; apples the principal fruit.

13. A majority of fields of wheat hardly any injured by the midge. Mediterranean nearly escaped.

14. No tile drained lands in Tioga county. Dr. Oakley of Owego speaks highly of tile draining.

15. The condition of farming is constantly improving—valuable improvements are made. I am indebted to L. P. Legg of Berkshire, J. B. Hill of Spencer, and Dr. L. Oakley, of Owego, for valuable information in relation to crops, &c.

THOMAS I. CHATFIELD. *Owego.*

1. Winter Wheat.—Fifteen bushels per acre; good quality; better than usual yield; rust and wheat worm affected it.

2. Spring Wheat.—Ten bushels per acre; good quality.

3. Indian Corn.—Thirty-five bushels per acre; never better.

4. Rye.—Fifteen bushels per acre; good yield.

5. Barley.—Fifteen to twenty bushels per acre; not adapted to our soil.

6. Oats.—Twenty-five bushels per acre; light yield; affected by dry weather and grasshoppers.

7. Buckwheat.—Ten bushels; below average yield; affected by dry weather.

8. Potatoes.—100 bushels per acre; better than usual yield; not affected.

9. Peas.—Twenty bushels per acre; not up to average yield.

10. Beans.—Ten bushels per acre.

11. Hay.—One ton per acre; fair quality.

12. Fruit.—Good quality; a better yield of good apples than for many years.

13. Wheat has been injured by midge. Mediterranean is the most hardy.

14. No tile drained lands in this county.

15. Farming greatly improved and still improving.

TOMPKINS COUNTY.

E. CORNELL, *President Tompkins County Agricultural Society.*

1. Winter Wheat.—Twelve bushels per acre; quality good; better than usual; affected by midge and exhausting culture; Mediterranean less affected by midge than other varieties, many crops very fine; less injured than for several years previous.

2. Spring Wheat.—Ten bushels per acre; early sowing fair, late sowing poor; five bushels to none; poorer than usual; affected by midge and dry weather.

3. Indian Corn.—Thirty-five bushels per acre; good quality; better yield than usual; season very favorable.

4. Rye.—Ten bushels per acre; little grown.

5. Barley.—Fourteen bushels per acre; fair quality; not as good as usual; affected by hard cropping. Our barley crop is gradually failing, I think from bad culture.

6. Oats.—Twenty bushels per acre; middling; not as good yield as usual; affected by dry weather and hard cropping, Oat crop, as barley, failing from same cause—bad culture.

7. Buckwheat.—Eight bushels per acre; average crop.

8. Potatoes.—Seventy-five bushels per acre; better than usual; little injured by disease; season favorable.

9. Peas.—Twelve bushels per acre; average yield; little grown.

10. Beans.—Ten bushels per acre; average yield; little grown.

11. Hay.—One and one-fourth tons per acre; good average crop.

12. Fruit.—Apples, one-half crop; pears, one-half crop; peaches, none; cherries, none; grapes good.

13. Midge injured wheat much less than for several years; the white varieties most injured; early varieties less affected; Mediterranean little injured.

14. Drained lands have been less injuriously affected by wet and drought than undrained lands. Though our farmers have drained but little, the benefits are so apparent, both in wet and dry seasons, that the practice will extend.

15. We have a healthy awakening on the subject of improvement in agriculture; perhaps more so than at any former period. Necessity is driving our farmers to adopt a better system of farming than formerly pursued.

WASHINGTON COUNTY.

Rev. E. H. Newton, *Cambridge.*

1. Winter wheat.—Very little grown; insect the cause of giving up culture.

2. Spring wheat.—Ten to fifteen bushels; usual yield; some injury from insects.

3. Indian corn.—Forty bushels per acre; equal, if not superior, to usual crop. Premium crops ninety-nine and a half bushels.

4. Rye.—Usual yield; premium crops nineteen bushels; but little cultivated.

5. Barley.—Good crop; but not much raised; premium crop thirty-five bushels.

6. Oats.—Forty-five bushels per acre; superior to usual crop; premium crop sixty and a half bushels.

7. Buckwheat.—About as usual.

8. Potatoes.—Crop excellent; but little disease; premium crop 314 bushels "Chilis."

9. Peas.—Very little cultivated on account of the pea bug.

10. Beans.—Good crop, though not largely cultivated.

11. Hay.—Crop heavy and superior in quality as well as quantity.

12. Fruit.—Less than usual; insects very troublesome.

14. Drainage is receiving attention and its effects most favorable.

15. The agricultural interest is advancing; lands increasing in value, and products increasing; owing to increasing intelligence, the stimulus of the annual fair, and facilities for market by canal and railroad.

WAYNE COUNTY.

Joseph Watson, *Clyde.*

1. Winter wheat.—Fifteen to twenty bushels per acre, where well cultivated; second quality being red wheat; yield better than most seasons

since the midge came amongst us; affected by the yellow midge, and no remedy but early varieties, early sowing, warm land, well cultivated, and then uncertain. Occasionally good crops of white wheat have been grown under peculiarly favorable circumstances.

2. Spring wheat.—Not much sown; yield variable; average below, and more uncertain than Mediterranean; better yield than usual; affected by midge and Hessian fly occasionally, but none this season. I think farmers are inclined to try it, and with some encouragement of success.

3. Indian corn.—Thirty to seventy-five bushels per acre. This is too much difference, by injudicious cultivation, to reduce our average unnecessarily; yield better than usual; affected by wet spring and late planting; remedy, draining, cultivator, manure and elbow grease. Lands well prepared, having proper after culture, have made good crops notwithstanding the unfavorable spring.

4. Rye.—In this corn region, not much is sown; fifteen to twenty bushels per acre; good quality; full average yield; affected by *still worm*; remedy, grind and feed stock. Our strong heavy land produces no more rye than the lighter soils, but more straw; and is liked to seed with grass.

5. Summer barley.—Twenty to thirty bushels per acre; fair quality; under usual yield; affected by late unfavorable spring; being wet and followed suddenly with hot, dry weather. Where land is suitable, *winter barley* is more sure, and produces much the best.

6. Oats.—Thirty to thirty-five bushels per acre; very light; much below usual yield; affected by rank early growth; immaturely ripened by hot, dry weather; some rust, but the failure not attributed to that generally.

7. Buckwheat.—Fifteen to twenty bushels per acre; good quality; average yield; affected by early frosts and too hot sun. A crop was sown, to be plowed under in *May*; but was left, and in this peculiar season gave a good crop.

8. Potatoes.—Fifty to 100 bushels per acre; good quality; above average yield. The rot swept my Mexicans clean; English Flukes and five other sorts, did well. This season has caused a looking for better success, with potatoes.

9. Peas.—None, except in gardens; average yield; affected by bugs; some scald seed and some sow late; none escape the bug in field.

10. Beans.—Fifteen to twenty bushels per acre; good quality; full average yield; very few raised. We use corn where the English use beans.

11. Hay.—One and a half to two and a half tons per acre; good quality; full yield, and I think above average. The early rains caused a good start of grass, and the favorable season produced, in some instances, very heavy crops of hay.

12. Fruit.—Apples; poorest crop I have ever known; bloomed full, drop off early, and the apples remaining on to ripen are disfigured by black spots; but very few fair, and not one-fourth of a usual crop at that. Peaches as good as could be expected from trees that have been twice frozen to death. Strawberries, currants and grapes, good.

13. The wheat has not been affected by the midge the past season, so much as any other season for many years past; no varieties of wheat escape the ravages of the insect; early red wheat least affected.

14. Drained lands have been less injuriously affected by wet and drought than undrained lands, in the few instances where the experiment has been tried. Some farmers know how to select and crop their dryest lots and let the stock graze the wild grass on wet lots rather than drain.

15. The general condition of farming is visibly improving. Croakers against the few who are devoting their lives in improvement of our agriculture, in the many ways that Yankee energy and skill only can progress against so great odds, can but see improvement and confess the fact; but they are slow to learn the same way and walk therein; and finally, nothing short of plainly evident self-interest will move the great mass; and they are learning to see their own interest measurably.

DeWitt C. Van Slyck, *President Wayne Co. Ag. Society.*

1. Winter wheat.—Fifteen bushels per acre; better than usual yield; affected by the midge; ravages of midge less than usual.

2. Spring wheat.—Ten bushels per acre; affected by midge, blight and rust; very little sown.

3. Indian corn.—Forty bushels per acre; yield better than ever before; great breadth planted.

4. Rye.—Very little grown.

5. Barley.—Eighteen bushels per acre; less than usual yield; affected by wet weather and midge; large quantity sown.

6. Oats.—Thirty bushels per acre; less than usual yield; affected by blight and grasshoppers.

7. Buckwheat.—Twenty-five bushels per acre; less than usual yield.

8. Potatoes.—Eighty bushels per acre; better yield than usual; good quality.

9. Peas.—Few sown.

10. Beans.—Few sown as field crop.

11. Hay.—One and a half tons per acre; better crop than usual; secured in good condition and good quality.

11. Fruit.—Less fruit of all kinds than ever before since the settlement of the county.

13. The Mediterranean is the variety principally sown, and has generally escaped the ravages of the midge; white varieties nearly all destroyed.

14. Drained lands have been considerably less injuriously affected by wet or drought, than undrained lands.

15. The general condition of farming is better, as compared with former years, and constantly improving.

WYOMING COUNTY.

E. L. Babbit.

1. Winter wheat.—Fifteen bushels per acre; quality poor; one-third less than usual yield; affected by midge.

2. Spring wheat.—Fifteen bushels per acre; quality good; average yield; no disease; more sown last year than usual.

3. Indian corn.—Fifty bushels per acre; quality first rate; yield better than usual; a large breadth planted.

4. Rye.—Very little sown in this county; no disease.

5. Barley.—Eighteen bushels per acre; good quality; about the usual crop. In a part of the county the crop was destroyed by grasshoppers.

6. Oats.—Very poor quality; not one-fourth of a crop; oats were destroyed by rust; they were light to the acre and light to the bushel.

7. Buckwheat.—A failure.

8. Potatoes.—Forty bushels per acre; good quality; slightly affected by rot in some places; but the crop is better than usual.

9. Peas.—Fifteen bushels per acre; good quality; no disease; not many raised in the county.

10. Beans.—Twenty bushels per acre; good quality; not many raised.

11. Hay.—In the east half of the county the crop never was better, yielding, on an average, two tons per acre. In the west half the grasshoppers injured the crop very seriously.

12. Fruit.—Apple crop very light; not a fourth of a crop; peaches same; plums, cherries, &c., a usual crop; Grapes, currants, &c., as usual.

13. Wheat has been seriously affected by the midge; no varieties have escaped the ravages of the insect.

14. Drained lands have been less injuriously affected by wet or drought than undrained lands.

15. The standard of farming is higher; there is reform in every branch of farming.

EDIBLE FISHES OF NEW YORK.

The committee, to whom was referred an essay on the edible fishes of New York. report that they have carefully examined the essay of Robert L. Pell, and deem it well worthy of the premium offered by the Society.

JOEL TURRIL,
T. C. PETERS,
Committee.

February 9, 1859.

EDIBLE FISHES OF NEW YORK,

Their Habits and Manner of Rearing, and Artificial Production. Prize Essay. Premium $100. *By* ROBERT L. PELL.

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THE TROUT.

Fishes are vertebrate oviparous creatures, having a heart consisting of one ventricle and one auricle. They are capable of breathing water, their air-bladders performing the duties of lungs, and the gills of respiration. The water taken in at the mouth, instead of entering the stomach, passes through the gill apertures and escapes, leaving behind the air contained in it, to act upon the blood. Fish are about of the same specific gravity as the element in which they live, but by means of their bladders, which they can dilate or contract at will, they vary their gravity, and descend or rise with the same ease that a bird does by expanding or contracting its wings, and are able to pass through the water in great rapidity, using as propellers members called pectoral, ventral, dorsal, anal, and caudal fins. The bodies of a large proportion of fish are covered with scales, and their teeth are the organs of prehension.

I have eight ponds on my farm, all artificial, and fed by springs; they are, with two exceptions, fourteen feet deep, and contain forty-five varieties of fresh and salt water fish; a portion of which, together with their habits, I intend to describe, and will commence with that most highly prized by sportsmen, the Trout (*Salmo Fario*).

The trout is the only fish that comes in and goes out of season with the deer; he grows rapidly, and dies early after reaching his full growth. The female spawns in October—at a different time from nearly all other fish; after which both male and female become lean, weak, and unwholesome eating, and, if examined closely, will be found covered with a species of clove-

shape insects, which appear to suck their substance from them; and they continue sick until warm weather, when they rub the insects off on the gravel, and immediately grow strong. The female is the best for the table. She may be known by her small head and deep body. Fish are always in season when their heads are so small as to be disproportioned to the size of their body. The trout is less oily and rich than the salmon; the female is much brighter and more beautiful than the male. This is a singular fact, and I believe the only creature, except woman, that is more beautiful than the male, in all creation. They swim rapidly, and often leap, like the salmon, to a great height, when ascending streams. When I first stocked my trout-pond, I placed fifteen hundred in it, and was accustomed to feed them with angle-worms, rose bugs, crickets, grasshoppers, &c, which they attacked with great voracity, to the amusement of those looking on. Trout and salmon will bite more readily upon a hook baited with their own roe than upon any other bait. They grow much more rapidly in ponds than in their native streams, from the fact that they are better fed and not compelled to exercise. Trout are the only fish known to me that possess a voice, which is perceived by pressing them, when they emit a murmuring sound, and tremble all over.

The trout may, with justice, contend with all varieties of fresh water fish, for precedency in daintiness of taste as he always feeds in swift clear streams with a gravelly bottom, and dainty palates well know that he is in perfection during the month of May, after which time he declines in flavor, as does the buck. Trout differ much in shape and size in different countries. In the lake of Geneva, Switzerland, they have been taken more than four feet in length. The largest ever known in England was caught in a small stream running through the park at Drayton manor, the country seat of the late Sir Robert Peel, it weighed nearly twenty three pounds. The skeleton is preserved in the college of surgeons.

In Kent, near Canterbury, rare trout are taken, called Fordidge, which are frequently known to reach the size of a two year old salmon; and have rarely been caught with the hook, except by Sir George Hastings, (long since dead,) who was a great angler; but he said it was entirely accidental, as food of no description had ever been found in one. The alimentary canal in trout, as well as in most fishes, is characterized by being exceedingly short, and the stomach's continuity with the entrals seldom marks a distinct line between them. The cæca are large and many in number; there are also tubular organs connected with the pyline appendages, which often appear like a bunch of worms, resembling the pancreatic vessels of bugs. Pancreas are only found in the cartilaginous fishes, such as the shark, ray, &c. The process of digestion is conducted much more slowly in trout, than in the system of birds, because the length of the canal is greater, and the blood is cold. The intestinal canal of the tadpole, is of very great length; but as the metamorphosis progresses, it lives upon various food, and it shortens by being collected into a circular mass, which the magnifying glass displays through its almost transparent skin. When the

tadpole becomes a frog, the canal makes one convolution only. This contrast is strongly marked between the elephant and the dromedary; the former inhabits fertile woods, and his colon is only twenty-six feet long; the latter arid plains, and his is forty-three feet. The ostrich has a still more scanty supply of food, and his is forty-six feet. As the food of the fish varies from the softest to the hardest matter, so we may observe every gradation in their systems, all of which are established by muscular fibers, adapted to the variations in animal or vegetable diet. If a fish lives on sea weed, such as the zostira maratima, the structure of its stomach will correspond with the gizzard of a bird. The Gillaroo trout has a stomach adapted to mastication and digestion; so has the common trout, to a certain extent; either of them, therefore, may live upon shell fish, and break the shells after having swallowed them whole. The trout affords capital sport; is a voracious feeder, and when taken, should be killed immediately by a stroke upon the head, when, if opened, will be found full of insects. If it is the intention of the angler to send them to a distance, cleanse them perfectly, bleed them at the tail, and pack them in a basket with dry straw, in preference to grass or any green water weed, which will heat and spoil the flavor; when boiled, salt must be placed in the water, which much increases the heat, and has a tendency to render the curdy matter hard, if not left in too long. The name of trout is specifically restricted to the salmo fario; but is applied in a generic sense to the salmo eriox, which is the salmo salar of Rondeletius, or grey trout; the salmo ferox, or lake trout; the salmo trutta, or salmon trout. Trout are subject to many varieties of color, and even internal structure, according to the variations of food and soil. Although this fish is usually short lived, still there are instances recorded, where they have lived for a long period of years. Mr. Oliver mentions one that had been confined in a well, at Dunbarton Castle, twenty-eight years; and the "Westmoreland Advertiser," of August, 1826, states that one lived fifty-three years in a well, in the orchard of William Mossass, of Board Hall. These are extraordinary instances; the trout requires four months to grow in season after spawning, and may be taken in several ways, thus: With a live fly, or artificial fly, by angling at the top of the water; with a float, or drop line, by angling at the bottom; with a small, live fish, by angling midway between the top and bottom; from the bank, with a short line, half the length of the pole, if the air is still; if windy enough to carry the line from you, let it be the length of the pole, and give him line from the reel if he is struck.

"Just in the dubious point, where with the pool
Is mixed the trembling stream, or where it boils
Around the stone, or from the hallowed bank,
Reverted plays in undulating flow,
There throw, nice judging, the delusive fly,
And as you lead it round the artful curve,
With eye attentive, mark the springing game,
Straight as above the surface of the flood
They wanton rise, or urged by hunger, leap,
Then fix, with gentle twitch, the barbed hook;
Some lightly tossing to the grassy bank,
And to the shelving shore, slow-dragging some,
With various hand, proportioned to their force."

THOMPSON.

THE TROUT STREAM.

Down where the darkened streamlet flows,
Where thick the tangled alder grows,
Where low beneath the knarled roots
Through the dark pool the minnow shoots,
There lurks at noon the speckled trout,
Shy peeping from his covert out;
Vainly the tempting fly we throw—
Cautious he views it swimming slow,
And circling round darts out of sight—
Just as we reckoned on a bite;
With indrawn breath and noiseless all—
Still careful of the shadow's fall,
Drop in the line where dark and cool
The sunken log obstructs the pool;
Deep in the shadow moves a fin—
A well-grown patriarch lurks within,
Whom watchful juniors follow near,
Desire repressed by instinct fear.

But vainly may the angler wait—
The trout swims calmly to the bait,
Perceives the snare and turns again
Close followed by the prudent train;
Beneath the bank, some deep retreat,
Receives them from the mid-day heat.

But when the evening shadows lie
Again the sportsman throws his fly;
Chosen with care and played with skill—
Dark treachery successful still,
Lures the unwary to his fate,
The hungry fish devours the bait;
Now struggling on the bank he lies,
And bright with spotted luster dies.

THE CARP (*Cyprinus Carpio*).

Of this delicious fish I have a great abundance; having obtained my original stock from Captain Robinson, of Newburgh, fourteen years since. They breed twice each year, producing about forty thousand each time, and grow to the length of fifteen inches. I have seen them on the banks of Lake Como, in Italy, weighing one hundred and seventy-five pounds. I feed them with bread and sometimes with Indian meal. They come up in great numbers at the ringing of a bell, and will eat out of my hand, and permit me to stir them around without showing the least fear. I have crossed them with the gold fish, or Chinese carp, and produced a great variety of colors. As soon as the ice forms in the fall they disappear in the mud, and as they are not afterwards seen, probably remain dormant in our cold climate all winter.

In Prussia, Germany and Saxony, carp are cultivated with great attention, and constitute a part of the revenue of the nobility. There is no reason why they might not be made profitable here. Fish are like hens, in one respect, that is, they never deposit all their spawn at one time, but at several periods, weeks often intervening, according to its maturity.

The carp belongs to the Linnæan genus of abdominal fishes, the family type of Malacopterygians in Cuvier's system, and of cycloid fishes in the system of the great Agassis. In an examination of one recently, I found it had two bladders instead of one, as is usual with most fish; they com-

municated with each other through the medium of a narrow neck. With this hydrostatic apparatus the fish buoys itself to the surface without any apparent exertion. There is a communication between the bladder and the gullet, into which he forces air from the bladder when he desires to increase his specific gravity, and sink to the bottom. The carp can, probably, secrete air from the blood. This fish has a pair of fins capable of making four motions, two by expanding and shutting the rays, and two by extension and flexion, for which proper muscles are supplied, with distinct muscular apparatus for each motion, so arranged as to regulate the movements of the fins with perfect nicety, expanding and closing them with the same facility that a lady does her fan. These fins are not used for effecting progression, but merely for inclining, stopping, or turning the body, and likewise retaining position in the water. The vertical fins prevent rolling when the fish darts forward, and the other fins are auxiliary instruments principally used in modifying the direction and adjusting the impulse derived from the tail, which is truly the oar of progression, rudder, and weapon of defence. Its action upon the water is lateral, similar to an oar, which in the vertical position it closely resembles; and every part of its wonderful mechanism is perfectly calculated to promote progress, and that it may be at all times free and unimpeded, nature has placed all the internal important viscera near the head, not even allowing room for a neck. The bodies of all fish are continuous with the head, as you may have observed, without an intervening thorax, the object being to leave space for the expansion of the coceygeal vertebræ, and the muscles which form nearly two-thirds of the bulk of the carp or other fish; thus all impediments are removed from mobility. On examining the peculiar manner in which the vertebræ of the carp are connected, I was surprised to find that two concave surfaces of adjacent vertebræ were applied one to the other, by the junction of the margins by an elastic ligament, which bends by the application of force to one side of the spinal arrangement, and is restored to its former position when the force ceases to act. Though the extent of motion in each separate joint is very small, but by multiplication of the entire series contained in the spinal structure, the effect resulting is great. A gelatinous incompressible substance fills each cavity of the cup-shaped hollows in the spinal column, constituting what may be called a spherical pivot for every motion of each joint. I at first concluded that this peculiar articulation would permit the carp to move his tail in every direction, but found that the extension of the spinal arrangement restricted the motions to a movement from side to side, and prevented all flexions down or up, thus making it incumbent upon the carp to strike the water laterally, being the only motion necessary. The number of these vertebræ differ much in various fishes, being multiplied to the extent of one hundred and ninety-nine in the shark. The muscles in the carp compose the majority of the bulk of its body, and are arranged in a very simple manner, so as to be oblique to the motion of the fish. There are two sets provided expressly for the movement of the tail, and consist entirely of

lateral flexion. All the vital organs of this fish have been placed in an inconceivably small compass, and its body tapers both ways, that it may form the least resistance to its native element as it darts forward, perfectly obviating the retardation that might naturally arise from the reflux of the water behind. The scales are smooth and somewhat impregnated with an oleaginous preparation to enable the fish to diminish friction, besides protecting its flesh from an injurious penetration of water by hydrostatic pressure. I found the bones pellucid, which shows that they contain a very small proportion of earthy phosphate of lime, which is not so much required as in the terrestrial animals, because joints are not needed by fish. Carp live longer out of their native water than any other known fish. In Holland they are kept alive twenty-two days, hung up in a cool cellar in a bag of wet moss, where they are perfectly fattened on bread and milk. As this practice is general in that country there must be advantage in it. They breed remarkably well, and grow large in ponds remote from cold springs; Aristotle and Pliny both say six times each year, if there are no fish to devour their ova. I saw the skin of one in the British museum, that was said to have weighed twenty-six pounds when alive; still they are rarely caught either in the ponds or rivers of England weighing over ten or twelve pounds. Buffon mentions that he had seen them in the fosses of the Ponchartrain known to be one hundred and fifty years old; and Sir James Smith says (in his "Tour on the Continent, 1793,") that "at the Prince of Conde's seat at Chantilly, there were enormous shoals of large carp, silvered o'er with age, like silver fish," and that "they were destroyed during the French revolution. In 1830 Sir James Smith found carp in the ponds at Versailles, which had been placed there in 1690, and they were white with age. "Those in the long canal in Hampton Court park are supposed to have been there since the canal was made by William the Third," notwithstanding Sir Francis Bacon says that carp live but ten years.

In Italy the ova of carp are made into caviare which is sold to the Jews, who will not eat the caviare of sturgeon, which they consider unclean, because they are devoid of scales. The physicians of that country convert the stones and galls found in the head of carp into medicine.

It requires great patience to take this fish with a hook and line. I have heard of good fishermen who angled six hours each day for three days, in a neighborhood where they were abundant, without having a bite. As the North river now abounds with them, in the vicinity of Newburgh, and near my place, I will here mention how they may be induced to bite: Having been taught to eat bread it is only necessary to convert it into a paste and dip it in honey. With a hook so baited you may take them readily early in the morning or in the dusk of evening. When prepared for the table it must be well cleaned but not scaled; then placed in a pot with the liver and blood, together with a small portion of parsley, margoram, summer savory, thyme and rosemary, three onions, four anchovies and fifteen pickled oysters; after which pour on a pint of claret wine, seasoned

with mace, lemon peel, cloves and salt; boil for twenty minutes over a hot fire. When dished pour on a quarter of a pound of fresh melted butter, and garnish the dish with the yolks of four eggs and slices of lemon. The barbel, tench, gold fish, dace, roach, rud, chub, bleak, bream, and forty-six others, belong to this genus.

THE GOLD FISH, (*Cygrinus Auratus*,) OR GOLDEN CARP,

Are the most beautiful and interesting fish in my waters, where they are only kept as ornaments, as they are not celebrated for their qualities as food. The extreme elegance of their form and scaly dress, and the agility and grace with which they move through their native element, cause them to be ranked among my most charming pets. They are always the first on hand at the ringing of the bell, and are even more gentle and confiding than the carp. I have noticed that by a proper diet I can increase the intensity of their color, change their external characteristics, improve the rotundity of their form, and add much to their size; and what is more surprising than all, those characters become hereditary in their offspring.

Those who have kept these fish in glass globes, are aware that food is rarely given to them, but that it is, nevertheless, necessary that fresh water should be furnished daily. Their food is therefore supplied through the medium of the water, in which there are multitudes of branchipods and other minute animalcules imperceptible to the naked eye; but as they are not sufficiently numerous to supply several fish with food, the water must necessarily contain some other nutritive matters, that we know nothing about. I suppose them to be plants, beyond the power of the ordinary microscope. When the Almighty laid the foundation of the earth we inhabit, He placed animals and plants upon it, that might be considered molecules animated with life, and though distinct, preserved the link that unites all creation together. We all know that vegetation cannot be prevented, from growing upon rocks, trees, walls, roofs, and, in fact, everything that exists. Observe any substance that has not been recently cleaned, and you will invariably find it covered with powder. Examine this through a microscope, and distinct plants will plainly show themselves; these die, and are succeeded by more perfect ones, until food is found sufficient in quantity to supply large trees with nourishment, so that all things that exist in the physical world, are dependent on each other. The gold fish was brought from China in 1691, and has become a universal pet among all nations. They do well in ponds, reservoirs and globes. Last winter one became frozen in the center of a large cake of transparent ice, in one of my ponds, about the 20th of December, and remained there until it thawed out in April, without injuring it in the least.

Nature has always shown the greatest solicitude to secure the perpetuity of all races, by the establishment of laws, the operation of which are certain under all contingent circumstances. I was particularly struck with an exemplification of this, on the 1st day of May last, when on approaching my gold fish pond, I observed three or four males following a female,

who was depositing ova indiscriminately, and many thousands were thus engaged; after the eggs were protruded, being heavier than water, they sank rapidly, and when midway, between the surface and the bottom, were overtaken by the milt ejected by the males, for which they had an affinity, it was not only heavier than the water, but the eggs also. Before the impregnated ova reached the bottom, it was seized upon by small fish that were following in schools, but in no instance as far as I could observe, before the milt came in contact with them. They seemed to know that food was better with, than without butter. At length the fish appeared to notice this destruction of their eggs, and consequent failure to perpetuate their race; and with one simultaneous accord, all rushed upon the roots of the willow, which encircled the sides of the pond to the width of twenty inches, and actually threw themselves upon them, partially out of water, male and female, and there deposited their eggs, and the milt upon them, entirely beyond the reach of the small fry.

In one instance, I noticed a female perfectly exhausted, after performing her duty to nature, lying upon her side upon the roots, two males observing her misfortune, actually sustained her, one on either side into deep water, and as long as I remained an observer, guarded her with care. The gold fish are very susceptible of electrical changes in the weather, and invariably indicate the approach of great storms by extreme restlessness; and may be justly called thermometrum vivum.

THE GOLD FISH POND.

Stand here upon the grassy brink,
Where trailing willows love to drink
In the still waters as they lie,
Reflecting back the cloudless sky.

You could not from the surface know
The world of life that lies below;
But let us sound the tiny bell,
Disturb the silence break the spell.

Now rising to the top, behold
The sparkling fins of burnished gold;
With varied lustre pale and bright,
The water turns to living light.

Leaping and darting, see them come,
In haste to catch the scattered crumb;
The brilliant gold fish seems indeed,
Most pleasing of the finny breed.

So tame and trusting comes to greet
The hand that brings the wanted treat;
See him protect with wondrous skill,
His future progeny from ill.

The weaker female guard and tend,
And almost human guidance lend,
Like to some champion knight of old,
Decked in his armor s scaly gold.

THE SUN FISH

Are known as the American carp, though they will not intermingle with either of the other varieties, European or Chinese, which they much resemble in habits, with one exception; and that is, they build nests in the gravel

to deposit their ova, over which they watch with unceasing vigilance, and cannot be induced to leave even for food; when the other fish are eating bread in their immediate vicinity, they appear to be unconscious of the fact, and chase them if they happen to come too near their sacred charge, showing every indication of extreme anger, by distending their gill covers, elevating their fins, &c.

On examining the skin of this fish, denuded of scales, I found it completely covered with a gelatinous mucous matter of a very peculiar nature, and likewise an apparatus under the skin through the medium of which it was probably secreted, and then ejected over the body through a number of minute openings, prepared apparently for the express purpose. These fish, if kept alive, as they sometimes are, to insure their being fresh, become thoroughly exhausted, and are inferior in quality to those that are immediately killed when caught. Their muscles are quite firm and free from oil, which renders them valuable as food, and particularly calculated for sick persons. As they are always found near the surface, they are great consumers of oxygen, and possess a considerable degree of muscular irritability and high respiration. Potatoes and carrots are the proper vegetables to be eaten with sunfish, when stewed with vinegar sauce, and parsnips, if boiled plain. They are chiefly taken with the rod and line, more often for amusement than profit; it is a sport of great antiquity, and is enjoyed with avidity by people of every grade in life, more than many other rural sports. Those who are fond of fishing, I have noticed, are generally placid, thoughtful, and particularly given to contemplate nature; it is well known that very eminent men have been attached to it, as a relaxation from the labors of study.

Many fish are improved by being kept alive in tanks and fed. I noticed in Austria every tavern by the wayside had a large box so arranged that a stream of cold water from a spring ran through it; in this were kept char, trout, carp, graylings, and several other varieties of fish for the use of the house—dead fish would not be tolerated at all. These fish are fattened on liver and bread, which they seem ready to devour voraciously at all times. At the splendid monastery in Styria, there are reservoirs and ponds abounding in numerous varieties of fish, and likewise at Cambridge College, England, kept for the use of those establishments. Much more attention was paid to these matters in England, before she became a Protestant country. In China, this practice is carried to the highest degree of perfection. Almost every establishment of note has its fish pond, in which are placed as many store fish as it can conveniently hold; they are fed three times each day, as much boiled rice and blood as they will eat clean. By this management they advance rapidly in growth, and become exceedingly fat, and, if intended for market, are carried alive in large tubs of cold water. The water is then drawn from the ponds for irrigating purposes, and the mud saved for top dressing. They are then filled and stocked as before.

Last year I drew off the water from a sun fish pond, and removed therefrom seven thousand loads of unsurpassed manure, intrinsically worth one dollar per load.

THE PIKE (*Esox Lucius*).

I have a large pond devoted to this fish, in which they abound to so great an extent, that I might supply half a dozen families the year round from it. They are the most notoriously voracious fish in our fresh-water ponds, and will devour young ducks, geese, rats, serpents and frogs; they have an amazing number of teeth, which they use in a scientific manner; there are seven hundred on the tongue, as well as both jaws and roof of the mouth. These ferocious fish have become with me as docile as dogs, and will assemble in numbers, when the small fry are fed, to seize upon them, which they accomplish in a masterly style. Some naturalists declare that this fish is of a spontaneous generation deriving its origin from a weed known as the pike weed, and that pike are only found where this weed is known to exist. The fact probably is, that the weed, as well as the pike spawn attached to it, are carried from pond to pond by the heron, or some fish hawk, attached accidentally to their legs, or eaten as food and ejected.

I have studied their habits with great interest, and find they retire in pairs, then after swimming together without touching each other, for a day or so, the female deposits her spawn in shallow places, upon aquatic grass, and the male following, fecundates them with milt, which he deposits over them; after having completed this interesting operation, they pass on and give themselves no solicitude as to the future result of their labors; but, when the small fry make their appearance, the parents devour them with great *goux* and apparent satisfaction. I have known a pike to swallow partially a fish too large for his throat, and to carry it thus in his mouth, until the portion swallowed was digested; he will likewise eat poisonous substances without injury to himself, having within him some antidote with which to counteract its evil effects. They never swim in schools, as many other fish do, but keep aloof from each other and like to be solitary and alone; they are not easily alarmed, and will never run from a shadow, as most fish invariably will; they often stand unmoved until I put my hand in the water, and will then dart at it boldly, if in want of food. Their bite is almost as venomous as that of a serpent, and very difficult to cure. Pike are particularly fond of frogs as food, but the frog always makes battle when the pike approach, and will sometimes mount upon his head, where they become very troublesome customers, placing their fore claws in the corner of each eye, and clinging with their hind legs. If this position is well taken it is utterly impossible for the pike to disencumber himself until the frog is willing to depart, which he usually consents to do when the fish approaches near enough to the shore to permit him to leap upon it. Pike grow faster than other fish in my ponds, making eight inches the first year, ten the second, fourteen the third, and twenty the fourth. I am convinced that an acre pond, well stocked with pike would yield more profit than a ten acre lot under ordinary cultivation. They are remarkably tenacious of life, and live a long time after being taken from the water, and

will snap at any object presented. It attains a great age and immense size if unmolested and well fed.

Pike should be considered the most celebrated among fish, from the fact that Noah selected them to take into the ark before all others. When he was commanded, "Thus of every clean beast thou shalt take to thee by sevens, the male and his female ; and of beasts that are not clean, by two, the male and his female," no doubt this distinction was known to the patriarch. The unclean animals, with respect to their food belonged to two great classes, to wit: zoophagous, or those which devour living animals ; and necrophagous, or those which devour dead ones. Of the first are the canine and feline among quadrupeds ; eagles and hawks among birds ; crocodiles and snakes seven among reptiles ; and pikes nine among fishes ; tiger beetles and ground beetles among insects.

Nothing can be more graceful and beautiful than the motions of a pike, when he glides through his own native element. Not to take into consideration the changing radiance of his form, as he chases the sunbeams, making facile progress unparalleled, except, perhaps, by the swift swallow. At one time he glides from our sight by a single movement of his tail! At another, suspends himself in mid water without heeding our presence, and we only know he lives by the quiet movement of his pectoral fins, which would likewise be inactive were they not necessary to respiration. The ventral fins that counteract the force of gravity ; the caudal that directs the locomotion ; the dorsal that counterbalances its effect in cross currents ; the anal which is antagonistic to the dorsal, and maintains the pike in position, are all still and appear as lifeless appendages to this creature of beauty, grace and symmetry. They may be justly considered one of the most long-lived among fish. A pike was taken in the year 1754, at Kaiserslantern, which had a ring attached to his gill-covers, mentioning that he was placed in the pond of the castle, by command of Frederick the Second, in the the year 1487, a period of two hundred and sixty-seven years ; it was nineteen feet long, and weighed three hundred and fifty pounds. Though not particularly remarkable for sagacity, still Lacepede mentions that some were kept for more than one hundred years in the basin of the Tuilleries, that would come when called by their names. They are predaceous fish, and admirably calculated to keep all aquatic tribes of every description within proper limits, and may well be called the tyrant of fresh waters, on account of his bold, ravenous and devouring disposition. A large pike was once caught in the river Ouse, which weighed twenty-eight pounds, and was sold to a gentleman in the neighborhood for a guinea. As the cook was cleaning him, she found, to her surprise, a watch with a black ribbon attached, and two steel seals annexed, in the body of the pike.

Its general color is an olive gray, very deep on the back, and marked on the sides by yellowish spots, irregular in form, somewhat resembling those of the leopard ; the abdomen is white, spotted with black. It is extremely prolific, and multiplies enormously, particularly in cold climates like Russia, where they attain the size of eight feet in length, and are taken in immense

quantities, salted, dried, and exported, forming an article of great commercial value. It is a remarkable fact, that nature, in order to permit the small fry of fish to attain some size before they become the food of the pike, have so ordered, that the digestive organs of this monster are partially torpid during the summer months, thus much diminishing his voracity. Were this not the case, I would find him far too expensive to maintain. The flesh is particularly dry, and far inferior to bass; but if fed on shad, killed by a blow upon the head, immediatiately on being taken from the water, bled freely by perforating the tail, roasted and highly seasoned, may be called a good dish.

The pike of the Medway feed on smelts, which gives them a cucumber flavor, for which they are much esteemed. They were very rare in England during the reign of Edward I, and were consequently introduced only at great dinner parties, its price then being five times higher than salmon, and ten times that of turbot.

I would recommend those eating pike on no account to swallow the bones, as they are excessively sharp, particularly hard, and defy the gastric juice of the stomach to dissolve them.

This fish belongs to the order malacopterygii, section Adominales, family Esocidae, and genus Esox. The fish of this order comprehend all those having an internal osseous skeleton with rays supporting the fins, soft, except the first ray of the dorsal and pectoral.

THE PIKE.

Beneath some overhanging bank,
In his hollowed-out retreat,
Waits the fierce rapacious pike,
His thoughtless prey to meet.

Most greedy of the smaller tribes,
The dwellers of the streams,
His hungry maw devouring still,
Yet still insatiate seems.

The terror of the lesser fry,
Who dart from out his way,
The weaker carp, the timid perch,
Are still his constant prey.

Nor sparing his own progeny,
Devours the tender brood,
And countless numbers perish thus,
Their savage parent s food.

THE YELLOW PERCH (*Perca Flavescens*)

Is a bold fish of prey, and like the pike, has a large mouth, well filled with teeth, a hog back, armed with two strong, sharp fins, which makes him a formidable prey for other fish. His outer covering consists of hard, thick scales. Like the pike, he will eat his own progeny. As food, he is considered more wholesome than any other fish, and is allowed, by physicians, to be eaten by wounded men, having high fever, when the flesh of all other fish is denied them. His growth is slow, and he breeds but

once a year. I have noticed one remarkable peculiarity connected with this fish; and that is, if a dozen are found in a hole, they will all bite, one after the other, and allow themselves to be caught, being, like most men, unwilling to receive the experience of their companions. They are gregarious during nearly the whole year, and grow under favorable auspices to a large size and elegant proportions. This fish is universally known throughout Europe and this country, and the remarkable manner in which its eggs have been distributed, has led to curious hypothesis. Some suppose them to be of spontaneous birth. Some years since I constructed a pond, but did not put any fish in it; and you may imagine my surprise, when I found therein, perch, sun fish, eels, bullheads, shiners, trout and sea bass, without my agency, and all within two years. Whence did they come? Birds were the undoubted agents, and it is to them lake Erie is indebted for the herring, striped rock, and white sea bass, and other fine fish. They have distributed the eel throughout the known world, and frequently carry them alive, as it is well known that the gastric juice of birds is not sufficiently strong to destroy the life of this serpent fish.

I have known perch to die in my pond from the bursting of their sound or air bladders, caused by loitering in shallow water for prey during an intensely hot day in August, and have, in some instances, saved their lives, when the bladder protruded from their mouths, by plunging them into cold water, the effect of which was a sudden condensation of the air.

They are very tenacious of life, and may be carried, by rail, two hundred miles, in dry chaff, and still survive the journey. An admirable quality of isinglass may be prepared from the skin. The jaws of the perch are unequal, and armed with incurved, sharp pointed teeth; gill covers are formed of three plates, the first of which is serrated; the sides are slightly gilded, and the body is marked by six broad transverse blackish bars. When approached by the pike, he boldly stands his ground, and sets up his formidable fins, which alarms the pike and causes him to flee, when he in turn is pursued by the perch and sometimes conquered. Two hundred and seventy-five thousand ova have been counted in a perch weighing three quarters of a pound. I have taken several hundred in my perch pond in an incredible short space of time, and find that they sometimes swallow the baited hook, which is difficult to dislodge, unless you have a small hollow reed or iron, which you must thrust down his throat, holding the line taught until you feel the hook, then draw the two out together. They subsist chiefly on small fishes, and never spare their own offspring. When taken out of the water, and nearly dead, will swallow any food presented to them, possessing, as they do, a violent and indiscriminate appetite, besides a remarkable digestive power, which appears to increase with the quantity of food eaten; this, though gelatinized, generally retains its natural form, showing plainly that a solvent power performs digestion, instead of trituration. As the perch invariably shows a predilection for food possessed of life, he is easily taken with live bait, and bites more readily in cloudy, windy weather, than at any other time. The number of

males is at least double that of females, the object being, through wise provision, the certain fecundation of the enormous quantity of extruded eggs. I have ascertained, to my entire satisfaction, that sexual union never takes place between male and female perch, nor do I believe it ever does among the oviparous family of fishes. The eggs, when extruded, are spherical in form, consisting of a white part called albumen, and yolk, containing a bright crescent germ between the white and yolk, which is not observable even with the aid of the microscope, until one day old. On the third day it attaches itself to the yolk, and presents the appearance of a heart, which it, in reality, is. On the fourth day it moves with quick pulsations. On the fifth day the humours encircling it begin to move. On the sixth, the back bone may be discerned. On the seventh, two small black spots are visible to the eye, unaided by the microscope. These are the eyes. After this, the whole figure of the fish appears to view in a curved form around the yolk. In its endeavors to straighten itself, the outer covering of the egg yields, and the fish is born with the yolk attached to its body. I am pretty well convinced, from the following experiment, that the age of all scale fish is indicated by concentric rings on each scale; and those apparently devoid of scales, by rings or circles in the joints of the back bone. I placed a brace of perch and suckers in a small pond; and last week, when their progeny were two years old, two circles were distinctly observed through the microscope on the scale of the young perch, and two rings in the vertebra of the suckers' back bone. As precision cannot be attached to one experiment, I hope others may be induced to try it.

Perch, before spawning, change entirely their external coat, and completely renew their skins, scales and colors, during which period they are sick, exceedingly languid, and appear to be full of suffering; refuse food, and are unfit to eat. Besides they frequently have a dropsical affection, which carries them off. When this occurs, their livers will be found covered with tumors, and their viscera infected by worms. This fish is probably entirely deficient of the discriminating faculty of taste, from the fact that I have not been able to discover any pores in his mouth to absorb the diluted lymph which is necessary to the sensibility of taste. It is therefore carried off through the water; whereas, in the human subject, there are numerous porous papillæ constantly absorbing lymph, which arrests asperities and stimulates the tongue and palate to taste.

Finding that the perch heard sound distinctly, I examined him with great care, in order to find out whether he had an external ear or not; and failing to discover one, dissected his head, and there found three cartilaginous semi-circular veins connected with a small bag filled with a gelatinous substance in which was floating a moveable officle, upon which the vibrations of sound are transmitted through the semi-circular veins or canals, that supply the place of the cochlea and vestibule. The perch is entirely destitute of palmated extremities, and is consequently unable to recognize forms; and on account of their hard scaly bodies, are not sus-

ceptible of the same delicacy of feeling with which nature has endowed numerous varieties of animals.

To observe how the function of respiration was performed, I placed a perch in a glass jar filled with water, and extracted the air by placing over the cork, which was perforated in the center and covered with oil silk, a tight vessel, in which was thrust a piece of sponge filled with alcohol and ignited. This exhausted the air almost instantaneously from the jar, through a small hole in the bottom. The perch became covered immediately with bubbles; then distended his gill covers with great rapidity for air; his abdomen became much swollen. When he rose to the surface, the stomach collapsed, and the perch sank to the bottom perfectly dead. The same thing will occur in ponds, if completely frozen over; therefore, it is necessary, if you would save your fish through winter, always to keep a hole open through the ice to admit atmospheric air.

THE STRIPED BASS (*Perca Labrax*)

Is a sea fish chiefly found near the mouths of rivers and arms of the sea, where they remain more constantly than any other ocean fish. They are readily known from the fact that they have eight parallel lines on the sides, like narrow tape; the scales are very large and lustrous, resembling metal; the eyes are white, head long, and under jaw projects beyond the upper; it is without doubt the most beautiful of all our native fishes. I have been enabled, after many fruitless attempts, to breed this magnificent fish in fresh water, where they have now become abundant. He is a bold biting fish, except in winter, when he becomes very abstemious, and will only bite in the middle of the day, when the weather is moderate, and continues to take the hook until the mulberry tree blossoms. The day before you intend to fish for bass, sink a glass bottle in the vicinity of their haunts, with small fish in it, covered with a piece of pierced parchment, or linen cloth; this will attract them in large numbers, and by dropping your line in its vicinity, baited with similar small fish, you may take many of them. They spawn throughout March; the female, followed by the male, opens a furrow in the gravel, and deposits her spawn; the male follows, ejecting milt upon it, and at the same time covers the furrow with his tail. This operation is performed with great rapidity and in the most scientific manner possible, so much so that no trace of the fish is left behind to indicate that the gravel has been moved. This may justly challenge the admiration of all beholders.

The bass appears to be constantly initiated by an insatiable desire of satisfying its hunger, by a wonderful predilection for everything that is endowed with life, whether fish or animal, as is the case with nearly all predaceous fishes endowed with large mouths, whose digestion must be performed by the solvent power of some particular gastric apparatus without the aid of trituration. The life of a bass, from the egg to maturity, is a scene of constant violence and hostility to all living things that exist under the surface of the water. Notwithstanding the amazing voracity of this fish, he is capable of enduring the want of food for a great length of

time; unless, perhaps, he may possess the faculty of decomposing and converting watery elements into a means of supporting life. This interesting fact remains still to be discovered. The ovaries lie in close contiguity to the abdomen, and the milt, which consists of a light colored glandular matter, is disposed in two sacs, adjacent to the back bone of the male. Of the eggs deposited by the generality of fish, not more than one in two hundred brings forth, as they form food for small fry, aquatic birds, and frequently larger fish; but those of the bass being carefully covered, stand a much better chance. The young bass do not begin to eat until they are five weeks old. The trout eat at four weeks, and the salmon at six; until this period, the yolk sack supplies all their requirements.

If it is found desirable to keep bass alive for the use of the table in sunken cars, it will be necessary to perforate the air bladder, by dexterously passing a needle through the body of the fish into it, that the confined air may escape; without this operation they would soon die. A male bass taken opposite my island, in the Hudson, a few years since, weighed sixty-five pounds, and by the concentric rings on each scale, was at least forty-five years old. I found his flesh tender and delicious; his external form being sharp at either end, and swelling in the middle, plainly indicated why he was enabled to traverse the element in which he was born with so great celerity, as to have torn the net almost to a shred, which feat he may have often accomplished before. It struck me while contemplating the beauty of this magnificent veteran of the deep, that man might imitate to advantage his peculiar form in the construction of any vessel designed to sail like the wind. The flight of an arrow could not be more swift than the darting of such a fish as this; he could, no doubt, pass over eighty-seven thousand feet in an hour, and make the circuit of the world with ease and comfort in a few weeks.

I have frequently observed bass when making progression, and been amazed at the flexibility of their bodies when exerted to attain any object; their tail, fins, and even the vertebræ of the back bone is full of vigorous motion, admirably calculated to mock the vain efforts of man's art to cope with the velocity of this noble fish, that can make a voyage of six thousand miles in a season, without showing symptoms of fatigue.

His organ of smell is large, and he possesses the power of dilating and contracting it at pleasure, as the olfactory nerve extends completely over the nostrils. He can discover food thrown in the water at a great distance behind him, by the sense of smell, and when he reaches it, if stale, turns off with apparent disgust, showing an intelligence that you would not expect to find in a fish. He sometimes spreads out his pectoral fins as oars, his dorsal as a poiser, to preserve his equilibrium, and his anal to maintain the vertical position of his body, and permits himself to be carried down the stream, that he may swim back against the current leisurely, and more readily seize upon descending prey, besides permitting atmospheric air more easily to impart to the blood, through the ramifications of the gills,

the proper combustion, without depriving the food of too large a share of carbonized and hydrogenated substances, thus rendering it fit for another class of fish when voided. The brain of a bass is small, relative to the size of his head; it is divided into three equal parts, of which the anterior are nearly contiguous, the third being in the rear, forms the cerebellum. Here may be seen the olfactory and optic nerves.

The gullet commences below the throat, and descends to the stomach; it is smooth, and lined with a mucous substance. The stomach is cylindrical, and divided into two parts.

The swimming bladder is elliptical, and is situated between the vertebræ and the stomach, and wholly included within the peritonœum.

The intestines are placed longitudinally, instead of transversly as in man. They are short, and terminate in the vent. The secondary closely resemble a group of worms, are numerous, and discharge in two canals that open into the principal intestine.

The liver is yellow, and is situated in the anterior region of the body, and is divided into two lobes; it contains much oil.

The gall-bladder lies directly under the liver, and communicates with the intestines, by means of the choledochic canal.

The spleen is dark, and placed near the backbone, and is pressed upon by the air bag, which subjects it to constriction and dilatation.

The urinary bladder is oval in shape, and terminates immediately under the tail, but does not communicate with the rectum.

The heart is on the sternum, just under the posterior gills; its position is longitudinal, and consists of one auricle and one ventricle. The aorta is attached to the heart.

SHAD.

The most interesting of all fish to me is the common shad, (*Clupea alosa*,) which may be regarded as a source of commercial wealth and national industry, and a miracle of Nature in its multiplication and continuance. Notwithstanding thousands of myriads are destroyed by the agency of man, and tens of thousands of myriads in the ova state, we find an undiminished abundance year after year, which can only be accounted for by their extraordinary creative ability. They spawn about forty-five thousand. They have a peculiarly sloping head and tapering body, projecting under jaw, sharp, small teeth, forked tail, dusky blue color, with a line of dark round spots on each side, sometimes four and often ten in number, and I have frequently seen them without any. They ascend our rivers from the 1st of April to the 10th of June, for the purpose of spawning, which they accomplish in the same manner that bass do, except that the male fails to cover the ova: this necessary operation is performed by the ebbing and flowing tide. The organization of this fish enables it to breath either salt or fresh water, and taking advantage of this fact, I have been enabled to breed them in ponds, and from numerous experiments, am led to believe that shad live but a single year, and that when they pass down our rivers, after spawn-

ing they are so weak and emaciated that they fall an easy prey to voracious fish. They grow in a single season to weigh from five to eight pounds ; they appear, as well as the herring, to have been created to form the food of the myriad inhabitants of the ocean. They take like the herring, (of which they are erroneously called by the fishermen the mother,) the circuit of the sea, commencing in the regions of the North Pole, in schools equaling in extent the whole of Great Britain and France. When they reach the coast of Georgia, they separate into immense squadrons, and as the season advances, run up all the rivers on our coast, followed, a little later by the herring. Late writers question the migratory character of these fish, and suppose that they remain throughout the winter in the most profound depths of the ocean, burrowing in the mud. This is bad philosophy, as they are not organized for living in mud, and the structure of their air bladders prevents them from sinking in deep water. Their form indicates clearly that they were designed by nature to swim near the surface of the sea, and to be always in motion. I have had herring in my pond, with shad, several hundred at a time, and never saw them at rest.

The shad lives upon suction, and feeds upon the animalculæ in the water while swimming. Food has never been discovered in the body of shad when opened, and they never bite a baited hook.

I have frequently noticed a fish in the North river, between the shad and the herring, smaller than the shad but larger than the herring, possessing the general characteristics of both. It ascends the river at the same time to spawn, and returns to the ocean after having deposited its ova.

This species is intermediate between the migratory marine and fresh water fishes, roving with the same indifference in ponds, rivers and the sea, intended by the Deity to supply persons remote from salt water with this great luxury at their very doors in vast abundance. I suppose there are taken, where these fish usually abound, at least one thousand million in a single year. Its body is always lubricated with a slimy preparation that facilitates its progress through the water wonderfully. And what is strange, if a single scale is removed, either by accident or otherwise, the fish inevitably dies in a few days. I have repeatedly tried this experiment and never knew it to fail. Still you may cut off a portion of the tail or fins, without causing either apparent pain or injury.

When I think of the migration of shad and other fish, and the consequeces that would accrue, not only to animals, but man, if fish never changed their quarters, I am filled with amazement, and thankfulness to God, for the care he thus takes of us all, having in view not only our sustentation, but gratification, likewise, in the variety of fish that he so organizes as to require a colder or warmer climate in which to breed or feed. What can possibly more strongly indicate design, than that the shad should be directed to seek so distant a clime from the Pole as ours, at a certain period of the year, for the propagation of their species, thus being productive of so much good to man, when, at the same time, they are gratifying their own passions and appetites, and following their several instincts. They are

attended by immense bands of predacious fish, which besides man partake of the harvest by devouring the stragglers, thus promoting the good of the entire system.

SALMON (*Salmo Salar*).

The upper part of the female is somewhat larger than the under, and in the male fish the under jaw curves up, so that the sexes may be easily distinguished by this peculiarity; there is a shade of blue on the back of both fish, with silver sides, containing dark spots of an irregular form; the teeth are on the tongue; and the scales are all striated. The Connecticut river was once famous for this magnificent fish; they traversed it to its highest branches, overcoming waterfalls and cataracts with the greatest imaginable ease, and, after depositing their ova, returned to the ocean, thin and emaciated; they have decreased in the same ratio that men have increased, and have now become extinct. When they enter fresh water, they are covered by an insect called salmon louse, which dies after the third day. They are then infested with fresh water worms, which die on their return to sea. Salmon cannot be caught by any person wearing a red shirt or cap, as they have a very great antipathy to that color, and when alarmed will swim at the rate of eighty-two miles an hour. It has been undeniably proved by many successful experiments that they invariably return to the streams in which they were born, to deposit their spawn, and when they go back to sea their haunts are unknown.

Their spawning-ground invariably has a gravelly bottom. On reaching it, they pair off, together make their spawning bed, which is often eleven feet long, and nine feet wide. The female forms a furrow, by working up stream, in which she deposits her ova, the male follows and ejects his milt upon them, and covers them with his tail. They are frequently engaged ten days in this occupation, after which the male fish directs his course towards the ocean, followed ten days later by the female, she having spent the intermediate time in the deep parts of the river, apparently for the purpose of rest. At the expiration of ninety days the fry are hatched, and have attached to each individual a small sack containing the yolk; this is gradually taken into the stomach by the natural absorbing function of the navel, and is the only food they require for sometime. The same wonderful provision is made in the eggs of birds. On killing and dissecting a chicken, half an hour after it was hatched, I found the yolk perfect and unbroken, the only difference was, that instead of being within a shell, it was within the chicken, ready formed to supply the necessities of life, as fast as the system required them. This is the reason, as I have often explained to farmers' wives, why young chickens do not desire food until some hours have elapsed after their birth; thousand of young chickens are annually destroyed by poultry-raisers, who make them eat too soon, and thus counteract the wonderful provision of God.

At different periods of their growth, salmon fry are known by different names; when one year old they are called penk. When they go to sea at two years old, smolt; when they return to fresh water, salmon. They live

about ten years. I think I can discover the age of any fish at any time within six years, and also the age of oysters. Food is rarely found in the stomachs of salmon when caught, from the fact that fright causes them to disgorge the contents before they are safely landed.

Salmon fry will weigh, when five months old, four pounds; ten months, eight pounds; sixteen months, fifteen pounds, showing that fish attain their growth far more rapidly than terrestrial animals. The brain bones of the salmon are peculiar—they are concave on one side, and convex on the other, with serrated edges, highly enameled, equal, in fact, to the human tooth; comparative anatomists consider them a part of the organ of hearing, but I really do not.

The salmon, together with the smelt, trout, salmon trout, common trout, and hucho, belong to the abdominal class, with many others; but here I intend to confine my remarks to this sovereign of river migrators; and I truly regret that in the United States, where it should, and easily may be, a general article of diet, it is reserved as a luxury for the epicure's table. Between Canada and the Pacific ocean, there resides a class of Icthyophagites, who live entirely upon salmon, and cannot be induced to make use of any other animal food. These Indians build with great ingenuity and labor across the streams a species of weir, formed with gravel and timber, from the bottom to about five feet above the surface of the river; beyond this there is placed a frame of timber work, six feet above the level of the water, forming passages leading into secure pens, over which the fish cannot leap. When caught they are strung and suspended in the water for a day, then cleaned by the women, partially roasted, and hung upon poles in their huts, where the smoke and heat cures them perfectly. God intended this fish should be a universal luxury for man, which is shown from the fact that it frequents almost every known sea, great lake and river—the Equatorial as well as Arctic. It has been considered strange that it abounds in the Caspian sea, whither it makes its way from the Persian gulf, through some undiscovered subterranean channel, which must exist, as otherwise the sea would be stagnant. They are likewise found to abound in the seas of Australia and New Holland, but never in the Mediterranean. It makes its way into Bohemia through the river Elbe, Switzerland through the Rhine, the Cordilleras of America by the Amazon, through which it traverses three thousand six hundred miles from the ocean. It is found in the French rivers during September; and at Kamschatka in October. On leaving the ocean the largest female is selected to take the lead, she is closely followed by another female; four feet intervenes, and another couple follow, then in the same order, observing a like distance apart, come all the old males, then the young. The noise made by them may be compared to the approach of a distant storm. When the sun is hot they remain near the bottom of the stream, but at other times not far from the surface.

It usually takes them three months to ascend the Amazon, swimming about forty miles each day. Their tail is exceedingly strong and muscular,

and when they wish to spring up a water fall, they are said to place that organ in their mouth, and, letting it go with vigor, spring clear of a cataract fifteen feet high; if they fail in the first attempt, they continue the exertion until the end is accomplished. The salmon leap at Leixlip, on the Liffey, is said to be thirty feet high. Their spawning season extends from the 20th of October until the 13th of January, and they usually deposit about twenty thousand ova, after which they immediately become dull in color; and present a ragged and forlorn appearance, and if eaten at this period will inevitably breed disease. Its food consists of marine insects and small fish. The flavor of salmon diminishes more rapidly than any other fish, and should therefore be placed upon the table immediately after capture, when it has a curdy substance between the flakes; this, being the fat, melts away after a day or so, and proves that the fish is stale.

The best mode of preserving the breed is not to permit any fisherman to take them in the spawning season, or to sell them weighing less than five pounds, and always to plant the ova of a dozen at the end of every fishing season. In Scotland, Ireland and Wales, salmon are frequently taken with the hook and line, affording great amusement to the angler.

But, at the fall of Kilmorae, on the river Beauly, in Invernesshire, there is a salmon leap, at the side of which, on a flat rock, a kettle was kept boiling, and the salmon frequently, on missing to overcome the fall in their spring, fell into the cauldron and were cooked alive. The Frazers of Lovat, who were lords of the manor of Beauly, were in the habit of entertaining their friends during the fishing season, under a canopy erected over the cauldron. As to the growth of the salmon, Sir Francis Bacon observes, that after he gets into the sea, he becomes, from a samlet, not so large as a a gudgeon, to be a salmon, in as short a time as a gosling becomes to be a goose.

There is, in all probability, nearly if not quite, as much nourishment in salmon as there is in beef, weight for weight; and when you take into consideration its soft and flexible fibre, you would naturally suppose it was more digestible. If you visit our fisheries you will find robust, hale and hearty men, with handsome, healthy women for their wives, and large families of children, entirely free from tubercular and scrofulous diseases, which may, in my opinion, be attributed to the fact that the fish contains iodine, a substance never found in the flesh of animals, or the food they eat. Iodine belongs to the electro-negative supporters of combustion, and is an irritant poison, but administered through the medium of fish, it will be found of great service in many forms of glandular disease.

THE SALMON LEAP.

Through countless miles of ocean reach,
  Where winding rivers gleam,
The faithful salmon tracks his way,
  Back to his native stream.

Unconscious of surrounding snares
  He makes his steady way,
Escapes the foes that lurk by night—
  The lines that stretch by day.

He stems the current, leaps the fall—
  Strong in his instinct—love;
Bounds through the foaming tide to reach
  The placid stream above.

See where between the parted rocks
  The sullen current flows,
There black and still the waters lie
  In shadowy repose.

There too the weary salmon rests,
  And there the dusky foe
At midnight comes, with torch and spear,
  To strike the subtile blow.

The red gleam from the bark canoe
  Marks where the Indian lies;
Bounding to meet the trait'rous light
  The noble salmon dies.

THE SUCKER (*Cyprynus Teres*).

This is a still, dingy-colored, lazy fish, and is particularly fond of basking in the sun, with its head towards the inlet, holding on by suction to some stone or root. Its mouth is shaped much like that of the sturgeon; the eyes are very large and without eyelids. Suckers sometimes grow sixteen inches in length in my ponds, and weigh one and a half pounds, but their flesh is not much prized as food. I have examined this fish thoroughly, and find his organs have not the least connection with those of respiration; his olfactory nerves are very large, and have, on that account been taken for his brain, and he has no external ear; he has three winding tubes in his head, which terminate in a bag filled with nervous marrow, containing three hard bones. This constitutes the whole organ of hearing, and the organ of taste is more imperfect still; the tongue has not even the papillæ, and the nerves branch off to the gills; the motion of the heart is far more independent of the spinal marrow and brain than in the higher orders of animals, and possesses motion for a very long time after the brain is destroyed.

These remarks apply to nearly all fish—at least I have not found an exception in my examinations. The first impulse in swimming comes from the tail, which, with its fin, serves as a rudder, to give direction to the motions of the fish, and the other fins regulate the position and guide him through his native element. Fish smell the bait much further than they can see it, and I have no doubt, from experiments that have been tried in my ponds, that their sense of smell is exceedingly acute, and their hearing sufficiently developed to be perfectly susceptible of all simple sounds, having the same acoustic apparatus that is found in the center of the animal's ear, but being enclosed in the bones of the skull in such a manner that the vibratory motion in water, of sound, comes in contact with the auditory nerve, and thus produces the sensation of hearing. The eye of the sucker, and many other fishes, is globular, with a flat cornea, and is, consequently, not extended as far into the field of vision as the eyes of terrestrial animals, which require an extraneous aqueous humor to keep the eye convex; fish do not, because the element in which they live is equivalent, and keeps the outer tunics always moist. Therefore, there being no tears for lubricating

purposes, I have never found a lachrymal sac. There is a wonderful contrivance of nature in the constitution of voracious salt water fishes' eyes, enabling them to bear against the pressure of water at great depths in the ocean, consisting of hard bone with an opening into it for the optic nerve. Fish that inhabit shoal water, possess a membraneous eye, and if forced into deep water they would immediately become blind, consequently you can judge accurately how deep any species of fish are enabled to swim. Fish having no eyelids must necessarily sleep with their eyes wide open, and are probably always enabled to see when danger is at hand; they see to a very great distance in clear water, but turbid water renders their vision indistinct. The whale can distinguish a boat nearly two miles off. I have noticed on removing the sucker from the water, that the light at first appears to paralyze the optic nerve, but soon thereafter the pupil diminishes in size, and the fish probably sees as well as a person would with his eyes immersed in water. On replacing him in his proper element he appears to be confused, and swims against any object that may be opposite to him. This experiment I have often tried, and never knew it to fail. The sucker is acutely sensible to the touch of the human hand, and his sense of smelling enables him to detect food, or enemies, at a very great distance. I have placed food with the oil of rhodium on it, at one end of a large pond, and have noticed the sucker, accompanied by the carp, perch and shiner, at the other end, immediately turn and swim to it. I have then placed a dog in the water at one end, and observed great uneasiness among the fish at the other end. Taste is probably the most weak of their senses, as they appear to swallow all sorts of food with avidity. Still, their flavor is influenced to a great degree by the nature and quality of their food, and this is the reason why the same fish vary so much in flavor on different coasts. The sucker is at all times capable of creating a vacuum between it and the substance upon which it rests, thus producing atmospheric pressure upon its upper part causing it to adhere perfectly well. If it desires to withstand a strong current, it flattens its mouth, thus contracting the sphincter, which at once produces a cavity, in the center of which the vacuum forms. By this arrangement the sucker attaches itself with a power nearly in proportion to its own diameter.

I examined yesterday the suckers under the feet of the common horse fly, (Tabanus), and distinctly saw no less than eighteen, or three under the surface of each of the first joints of the toes of each foot. With this refined and wonderful apparatus, he was enabled to ascend and descend with great rapidity, the perpendicular sides of a glass bottle in which I confined him to examine his motions through the medium of a microscope. When he suspended himself to the top of the bottle, he seemed to do so without any exertion; and the weight of his body strengthened his powers of adhesion. This accounts for the reason why flies invariably seek the ceiling instead of the sides of a room, as a place of rest.

Imagining the insects that are accustomed to walk on the water, had some similar contrivance on their feet to buoy them up, I brought one

under the influence of my glass, and, to my surprise, found nothing of the kind; their feet were covered with fine hair, arranged something like a brush, the ends of which were perfectly dry and incapable of becoming wet by contact with water. By dipping them in alcohol, they at once became saturated; and when the insect was returned to his native element, he sank and was drowned.

MUSKELLUNGE (*Esox Estor*).

The body of this fish is cylindrical, scales small and thin, covering partially even the cheeks; the head is perfectly smooth, snout broad and depressed, mouth very large, teeth are arranged in the anterior portion of the lower and upper jaw, and acute teeth on the sides of the lower jaw; there are likewise small teeth on the palatines and vomer. The color of the back is quite dark, the sides pale, and covered with yellow spots varying in size, and they not unfrequently become confluent. They inhabit the waters of lake Huron, lake Erie and Champlain, where they are caught in seines, and considered an admirable table fish. The male and female copulate and extrude a certain number of ova, and this process is repeated until all the ova are disposed of.

The muskellunge is a notoriously voracious fish, and subsists on rats, serpents and young aquatic fowl, and has been known to bite the noses of cattle when they approached the lake to drink. It is expensive to keep them in ponds, from the fact that they require constant feeding, and are very destructive to many varieties of fish, besides devouring their own progeny. The flesh is good, particularly when roasted. Between the layers, there occur slender semi-transparent tendons, which attach a series of muscular fibers to the adjoining plates. The feathering of the fins is particularly observable in the tail of this fish, and each ray of each fin is furnished with a perfectly distinct muscular apparatus for its separate motion.

The muskellunge possesses the power, in an eminent degree, of altering its specific gravity at will, by means of a large air bladder directly under the spine, in the center of the back, and over the center of gravity. By distending it with air, he rises to the surface instantaneously, and remains there as long as he pleases without the slightest effort. By compressing the muscles, the air is condensed, the specific gravity of his body increased, and he as rapidly sinks to the bottom.

This hydrostatic machine operates upon philosophical principles for this unequivocal and definite purpose. What an evidence of design.

THE BLACK BASS (*Labrax Nigrigans*).

This fish found its way to me through the Erie canal, and ran up a creek on my farm to spawn, where it was taken in large numbers and transferred to the ponds, together with many other valuable fish from the great lakes. My attention was called to them from the peculiar and extraordinary manner in which they were preparing to deposit the ova and milt in large holes,

made by the most strenuous exertions of both male and female, who were so intensely occupied with their pleasing occupation as not to heed me, though sitting on the back of a horse that was alternately drinking and pawing the water, within a few feet of them. They deposit their ova in May, and the small fry are hatched by the first of June, the term of incubation being about twenty-one days, the same as the fowl.

The body is oval, back round, color greenish, bands transverse, stripes oblique, three in number, running from the root of the tail to the eyes, and they grow until twenty inches long, weighing seven or eight pounds. When taken with the hook, he becomes perfectly furious, and fights as long as life lasts, with determined rage, thus affording fine sport to the fisherman and a delightful morceau for the table.

I caught, at the same time, another fish closely resembling the black bass, but different, having a mouth three times larger, a larger head and larger scales. In other particulars he might readily have been taken for the same fish; he thrives in artificial waters, but does not mix or associate with the black bass. They spawn in April. The female, unassisted by the male, forms a species of nest in the gravel, in which she deposits her ova; he follows, impregnates and covers them. The flesh of this fish is inferior to the black bass, though firmer; when taken, he is very fierce for a minute, then gives up and lies quietly until he dies. Both his jaws are lined with recurved teeth, as well as the vomer and palatines. The tongue likewise has a row of teeth on the center of it. I have noticed that this fish possesses the remarkable faculty of changing its color at will, and in an inconceivably short space of time. When you come suddenly upon him, you see him plainly; directly he vanishes and you imagine he has gone; in a few minutes he gradually assumes his color, and you behold him again in the same spot. I do not know what to call this fish, as he cannot be identified with the black bass, differing from him as he does in physical form and habits; yet, when seen side by side in the water, they cannot be distinguished apart.

If you would breed this fish artificially from the egg, they must be perfectly ripe before being pressed from the female, which is indicated by the facility they leave her, if the least violence is necessary the operation will be premature. Let them fall slow, three or four at a time; and the instant they appear mixed with other matters, stop. The milt must be pressed out in the same careful manner, and should flow abundantly, about the consistency of cream, free from membraneous substances. Then stir the ova with a glass tube, in such a manner that every portion of their surfaces come in contact with the milt. In about three minutes the fecundation will be complete.

The milt of a single male will suffice for the fecundation of the ova taken from fifteen females. Place them in a box four feet long, two feet wide, and four inches deep, with a layer of sand and gravel on the bottom, one inch deep; a layer of ova thinly distributed, and a layer of sand and gravel one and a half inches deep. Place them where cool water will

constantly pass slowly over them, and they will hatch in thirty days; or if placed in an egg under a hen, in fifteen days.

The French mode is to charge the water with milt, and drop the ova in the mixture, stirring the mass slowly and carefully for about five minutes, when complete impregnation takes place. They consider that the milt of a single male, if used when fully mature, will impregnate the ova of thirty females, provided he is gorged with food six hours before the spermatic fluid is expressed.

I have found that if the least violence is necessary to express either the ova or milt, the operation will be premature, and the experiment unsuccessful. The eggs must fall slow; four or five at a time, and be entirely free from extraneous matters.

ROCK BASS (*Centrarchus Æneus*).

This is an admirable table fish, and is well known and appreciated by those living on Lakes Erie and Champlain, where it is considered one of the very best game fish, biting freely, and fighting to the last. They weigh about one pound each at the age of two years. The body is compressed and short; head entirely free from scales; the preopercle has small scales upon it, and the opercle large ones. I observed, when using a strong glass, that their margins were denticulated, and truncated at their bases. There are seven rows of scales above the lateral line, and twelve below it, and they ascend in such a manner upon the fins as to form sheaths for them, as in the Scienidœ. The nostrils are two fold and small; lower jaw larger than the upper; teeth small and conical; their stomachs are peculiarly formed, having six cœcal appendages, all of which are generally filled with young fish that they have caught. The rock bass, when first taken from the water, presents a dark bronze green appearance, with a bottle-green head and metallic-green gill covers. Subquadrate longitudinal brown spots appear below the lateral line; the eyes are large, pupils purple, and surrounded by a narrow yellow ring; the ventral fins are edged with blue; and he may be considered a very beautiful fish.

They are now quite abundant in the Hudson river, and often taken by shad seines. They spawn about the 20th of May, on gravel shores; the female makes a zigzag opening in the gravel, and lays her ova, and as she does so, partially covers them with sand, whether purposely or not I am unable to determine, and the male makes his deposit on the gravel, instead of upon the ova. It is quite possible that if ejected upon the ova it might be too strong, and destroy them. I have been enabled to dilute the spermatic fluid of the frog five hundred to one, and found it capable of impregnating the eggs of the female, and forming a perfect tadpole. I have come to the conclusion, after making numerous experiments, that no fish can be induced to eat anything while spawning, and some remain a long time without food, notwithstanding they require so large a supply of nutritive matter for their sustenance generally; and it is singular that whatever variety of food this fish habitually eats, the same precise proportion of ni-

trogen is found in the chyle, and nearly the same in the blood. Nature dispenses to each fish the quantity and quality of edibles best calculated for their individual subsistence, in such a manner as to cause the smallest possible waste. In fact, there is no vegetable or animal structure in the universe, however close its texture, that does not become the chosen food of some fish, animal or insect. The deadly night shade, poisonous henbane, and acrid nettle, are selected as food by more than one hundred species of insects, and these afford delicious nourishment to the rock bass, whose nutritive functions may be divided into seven parts, to wit: circulation, assimilation, respiration, secretion, excretion, absorption and nutrition, and many of these may be subdivided.

The moment food enters the mouth of this fish, a fluid secretion comes in contact with and softens it. It then enters the chemical laboratory, undergoes digestion, passes into the intestinal tube, becomes a completely nutritious milky fluid, supplies the proper vessels, which, by impulsive force, distribute it throughout the system. Beyond this I have not been able to go, as the intricate processes and faculties of sensation are perfectly mysterious and inexplicable.

The muscles of this bass, as they contract, become thicker, and while some are in action, others are relaxed, all co-operating to produce certain effects without contracting any of them beyond a proper extent, thus always economizing muscular power, which is in constant requisition.

The nervous power of the rock bass is derived from the spinal marrow and brain; it regulates the vital functions of circulation, secretion, digestion, and combines, adjusts and insures perfect harmony to the vital functions.

THE WHITE LAKE BASS—(*Labrax Albidus.*)

Was caught at the same time, and may justly be called a very beautiful fish. Its color is a bluish white, with dusky narrow parallel streaks beneath the lateral line; the sides and abdomen are silvery white; irides white, pupils intensely black; the caudal and dorsal fins are brown, edged with blue; pectoral fins white, bordered with green; ventral fins blue, tinged with white; weighs about one and three-quarter pounds, and can have but few superiors as an article of diet. This fish is admirably adapted to do well in ponds. It spawns about the middle of May, in gravel; the male opens a trench three inches wide and one inch deep, by forcing himself through with great vigor and rapidity; he is immediately followed by the female, who deposits her ova, and when she stops to rest he returns behind her, drives off the little fry that always follow to eat the spawn, showing great anger by expanding his tail, opening his gill covers, and raising his fins to their utmost capacity, and occasionally swallows several of them at a time, being a very voracious fish. Having cleared the ground, he impregnates the ova, and covers them with his tail, by which time the female is ready for a new furrow, and the work progresses. She appears to deposit all her ova in about four hours, commencing usually

at ten o'clock in the morning. He is a great feeder, takes the hook readily, baited with live or dead fish, artificial flies or red flannel.

The crystalline lens of the eye of this bass is completely enveloped in thin layers of a substance which transmits polarized light The middle portion is composed of hard, spheroidal, transparent, concentric laminæ, having an iridescence similar to mother-of-pearl. The cornea, retina, optic nerve, lens, vitreous humour, choroid gland, and sclerotica, are beautifully perfect, and will well repay an examination by those interested in such matters. The denticulated structure of the lens contains over sixty millions of teeth, each one performing its part towards locking the fibers together. You can readily discover whether a fish is destined to exist in the air, as well as water, by the construction of the eye. The cornea of such creatures protrudes excessively, and is furnished with aqueous humor, besides which the form of the eye is spherical, and the lens is possessed of less refractive power, because the chief refraction is indebted to the cornea and aquecus humor.

Perhaps I may be excused in this connexion for mentioning a fact that has come under my observation respecting the eyes of serpents, which have generally rudiments of eyelids, but not of extent sufficient to cover the entire eye. Having observed, on three occasions, that a black snake, when moulting, would permit me to approach it without attempting to escape, excited my surprise, and I determined to discover the reason; and on examining a subject, found the globe of its eyes covered with a transparent outward cornea, under which the ball had unobstructed motion. Strange as it may appear, when the snake moults he sheds this outward cornea, with the cuticle, and as it detaches, air finds its way under the membrane, and causes it to be opaque, and the snake becomes perfectly blind, until the final completion of this extraordinary operation. And notwithstanding the written opinion of many writers, that snakes have no lachrymal passage, I found one in this leading directly from the corner of the eye into the mouth; and subsequently in the water pilot, a similar passage or canal leading into the cavity of the nose, and as the one was harmless, and the other poisonous, this little discovery may decide, when skeletons are found, whether they belonged to venomous or harmless snakes.

THE BULL HEAD—(*Cottus Gobio*),

Is universally known over the whole continent, being adapted to all latitudes. It is a disgusting looking fish, having an olive-colored body, with a black back. The head is out of proportion to the rest of the body, and has a long sickle-shaped spine on each side of it. They seldom exceed twelve inches in length. The habit of this fish, when about to deposit its ova, is to build a regular nest in the mud, which it carefully lines with aquatic grass; in this the female deposits her eggs, which in due time hatch, and are protected with great care and apparent anxiety by both male and female until large enough to look out for themselves. These nests may be found all along the shores of the Hudson river. When taken from the water it

grunts, by inflating the gills and muscles of the mouth, and then expelling the air through the gill covers. It lives on worms, water insects, crabs, muscles, and the ova of other fish. It is very strong, swimming with great rapidity, and is exceedingly voracious. In Greenland it attains the length of six feet, where it is much relished as an article of diet. When taken from the water it immediately closes its gill covers, and excludes atmospheric air, which enables it to exist a long time. When boiled its flesh resembles salmon, assuming a pink color. There are thirteen others belonging to this genus.

The Virginia water, in England, covers somewhere in the neighborhood of ten hundred and fifty acres of land. It is well stocked with a great variety of fish, and among others the cottus, which His Majesty, George IV, was very fond of taking. He had a splendid set of fishing tackle, made by the famous Ustouson. Among its sparkling decorations were diamonds, gold, silver and velvet.

THE TENCH (*Cyprinus Tinca*),

Is known as the physician of fish. He is covered by a glutinous slime that will immediately heal any wounded fish coming in contact with him; it has often been observed that the tyrant pike, though starving, forbears to devour the tench. He has large fins, small smooth scales, a red circle surrounding the eyes, which are of a golden color, and there hangs from either angle of his mouth a little barb; in his head are two stones that physicians make use of, but have not communicated for what purpose. It is a sub genus of the cyprinoid fishes, and is characterized by short dorsal and anal fins, without a bony serrata ray at the commencement of either of them; their teeth are located in the pharynx; whence they derive the name of "leather-mouthed fishes." Tench are abundant in nearly all the stagnant waters of Great Britain, which they particularly enjoy; they are remarkably tenacious of life, very prolific, and spawn about the 1st of June. The female is usually followed by two males, as she extrudes small green ova so fast that one would be unable to impregnate more than the half of them. They feed upon vegetable matter and minute aquatic insects, are of rapid growth, and hybernate in the mud.

"A piece of water at Thornville Royal, Yorkshire, which had been ordered to be filled up, and wherein wood, rubbish, &c., had been thrown for years, was, in November, many years since, directed to be cleared out. Persons were accordingly employed; and, almost choked up by weeds and mud, so little water remained that no person expected to see any fish; yet nearly two hundred brace of tench of all sizes, and four hundred perch were found. After the pond was thought to be quite free, under some roots there seemed to be an animal, which was conjectured to be an otter; the place was surrounded, and on opening an entrance among the roots, a tench was found of a most singular form, having literally assumed the shape of the hole in which it had been many years confined.

"His length, from fork to eye, was two feet nine inches; his circumfer-

ence almost to the tail, was two feet three inches ; his weight eleven pounds, nine ounces and a quarter, and his abdomen the color of vermillion ; he was removed to a pond and swam gently away."

As constant mutation most assuredly constitutes the fundamental law of nature, how did the bodies of these fish undergo the necessary progressive changes in their several dimensions, composition, figure, &c., without eating?

BARBEL, (*Cyprinus Barbus.*)

This fish is so-called from the barb that hangs under his lips ; he has a leather mouth, and is exceedingly strong, often breaking, when caught, not only the line, but pole also. He is neither fine flavored, nor wholesome. They follow each other like a flock of sheep, and much enjoy swift, shallow water ; when they feed, they root in the sand with their noses like hogs, and wallow in the holes they make ; when about to spawn, they usually seek deep water, and a muddy bottom, where the female, assisted by the male, digs a hole, in which she deposits her spawn, and the male impregnates and covers them. At certain seasons they run up the Danube in such immense shoals, that fishermen standing in the water with their carts near, are enabled to pick them up as they pass, and load cart after cart. In the month of May, the ova are poisonous, and endanger the lives of those partaking of it, acting like an emetic.* In winter they collect along the shores in parallel lines, with their heads against the bank, where they become partially torpid, and will permit you to push them about or catch them, without attempting to escape ; they grow to weigh fifteen or sixteen pounds, possess a beautiful shape, and peculiarly formed scales. They are a sullen fish, and at some seasons bite slowly, as is instanced by the following story :

A traveller saw a gentleman fishing on the bank of the Thames, and said, " What luck to-day, sir ?"

The angler answering, replied, " I am a man in years, and have been at sea all my life, but I mean to go no more ; and have bought that house you see there, (pointing to it,) for the sake of fishing. I get into this boat (which he was then mopping) on Monday morning, and fish till Saturday night for barbel, for that is my delight ; and this I have done for a month together, and, in all that while, have not had one bite."

A barbel does not appear to feel when you touch him, except you come in contact with the cirrhi appended to his mouth ; fishes generally are badly constructed for the exercise of this important sense ; the principal seat, however, is the end of the nose, which in all fishes is admirably supplied with nerves, but not in sufficient perfection to comply with the conditions on which the sense of touch mainly depends. There are an abundance of soft papillæ supplied with nerves, fine cuticle, a soft, cellular substance underneath the skin, a resisting basis similar to that under the nails of our fingers.

DACE (*Leuciscus Pulchellus*).

This is one of the most beautiful of the bass family, and an excellent fish for the pan ; is particularly satisfied to live in an artificial pond,

*Note.—There are times when the spawn of all salt water fish is poisonous.

without inlet or outlet. Being sluggish in his habits, he is unwilling to contend with rapid running water, and may always be found in some quiet corner, apparently meditating upon the cares and pleasures of life. Being a small and dainty feeder, he appears always satisfied and contented.

His back is variegated, and general color a sea-green, with dark brown spots on the lower part of his body, and irregular streaks above; the fins are all edged with spots of brown. This fish is particularly tenacious of life, and will live six hours wrapped up in wet flannel. They spawn about the first of June; the female swims leisurely through the water, dropping her ova, followed closely by the male, who ejects spermatic fluid upon them as they sink, and it is a remarkable fact that the milt always overtakes the eggs before they reach the bottom. Nature never fails to procreate her species.

As the carp is generally called the fox of the pond, on account of his apparent sense and cunning, so the dace is known as the pond sheep, for his simplicity and want of the other's accomplishment.

In fourteen days after spawning the dace is in season, whereas the barbel and carp require a month, and the trout four months and a half. They bite on gentles, which may be easily bred: Take a piece of beef's liver and hang it over a half barrel of dry clay, and as they fall, will conceal themselves in it, and will be always ready. If you desire this species of bait for winter fishing, let a dead animal of any kind be fly-blown, and when the gentles appear, bury it in a warm, protected situation, under a hot bed frame, in soft, moist earth, and they will last until April. The young brood of wasps makes capital bait, particularly when their heads are dipped in blood. This fish, as well as trout, sometimes refuses to bite the most tempting bait. When you find such to be the case, place upon the point of the hook, the smallest imaginable piece of red flannel, if that should not tempt them try green or even white, and I will engage, during that day's sport you will, when you hit upon the favorite one, take all the fish in the neighborhood, even if there are a dozen fishing beside you. Camphor mixed with your bait, will sometimes cause you to be the fortunate angler of the day, at other times the oil of rhodian dropped upon the hook, or worms covered with vermilion; grasshoppers, with their legs pinched off, will cause you to make incredible havoc among the finny tribe. If you would really be a fisherman, and surpass all others in that line, open the first fish you take, examine the contents of his stomach, and you will immediately discover the food he fancies at that particular season, bait with it and success will attend you. Your line should consist of a single hair, or the finest gut, for dace fishing. A favorite bait for any kind of fish may be made of wheat, thus: Boil it until soft, and fry it with honey and safron dissolved in cream. The spawn of salmon or trout is always acceptable to all kinds of fish, and none more so than themselves. If thrown any where near them they will be sure to venture their lives for it.

THE EEL (*Murana Anguilla*).

In one of my ponds I placed a stock of three thousand eels, weighing from six ounces to two pounds each, and endeavored to study their habits. During the day they partially conceal themselves under stones, stumps and mud, exposing the head only to view; and in this manner they watch for their prey. They delight particularly in still, muddy water; and notwithstanding naturalists have decided that they are viviparous, and that lumps of little eels have been found in them, the size of a fine sewing needle, I have come to the conclusion that it is a mistake, and arose from the fact that eels are often infested with small worms, which have been taken for small eels. They are undoubtedly oviparous and go to brackish water to deposit their ova, because it is more than two degrees warmer than the ocean, or water in rivers, and being impatient of cold, have sufficient instinct to direct them to suitable localities. I found in the fall my eels all left the pond, not one remaining to breed in it, and many returned the following spring of all sizes. I then stocked the pond again, and in the fall placed fine salt in it: the eels then remained, deposited their ova in the pond, which in due time hatched there, and produced a great quantity of young eels. I am convinced, though I have never seen either spawn or milt in eels, that they have all the necessary parts of generation, as well as other fish; they are very tenacious of life. I have known them to live five days in a grass meadow, and when returned to the water swim with their usual rapidity. The reason that they are enabled to respire when out of water for a longer period than are any others, is in consequence of the extreme small size of the aperture for the escape of water from the bronchial cavity. When taken from the water they instantly close this opening with great facility, and retain the water. I have placed them one hundred yards from the pond, and found that they would invariably turn towards the water and make their way to the nearest point, evincing a strong migratory instinct. Eels are supposed to be spread over the world more universally than any other animal except man, but none are seen in situations where they cannot get to salt water. For example, they are not found in Lake Erie, above the Falls of Niagara. Eels were never seen above the falls of Patterson, until the canal was cut; ever since that period they have been found in immense quantities and of exquisite quality. They are nothing more nor less than water serpents, and may be called the connecting link between amphibious and aquatic reptiles. They have been caught in New York harbor weighing thirteen pounds. As an article of food they are extremely nutricious and rich, but contain a large quantity of oil, and unless eaten with an acid, are apt to occasion derangements of the digestive organs. Eels are covered with a mucous substance, which makes them difficult to hold, and has led to the notion that they are devoid of scales. This is an error, as I have discovered them readily with a magnifying glass.

The eel must be rubbed partially dry when there will be no difficulty in perceiving them; this is good news for the Jews. The true silver eel is caught in the Hudson river in the fall of the year, when they are in their

prime, still they are never out of season, but less nourishing in May than any other month in the year. The older they are the better, being one of the few fish that improve by age. Angling for eels is one of the most unpleasant occupations that a sportsman can possibly be engaged in, and probably as detrimental to tackle as any other fish. They are usually skinned alive, which is a cruel barbarous and unnecessary practice. When caught the head should be cut off, after which they will still move and show apparent life, this is owing to a peculiar irritable property they possess. In England there is an island named Ely, on account of the immense number of eels that breed in its vicinity; there is a period in summer when they abound there to such an extent, that the poor people catch them in sheets, pillow cases and sieves, and make them into a species of cake which they eat like bread. I have taken eels out of the pond when the migratory desire was upon them, and placed them in a grassy field, when they have made their way directly to the river, instead of returning to the pond, which was much the nearest. It is more vivacious in the water than any other fish, and tenacious of life when taken from the water, and will live a week in wet sand. In mid winter it buries itself deep in the mud.

SWAMP PINES.

This is the name given in Carolina to a fresh water fish that is found inhabiting ponds, which often during hot summers become dry, when the fish prepare themselves to migrate to the nearest pool, by closing a membrane attached to the mouth, which may be called a compensating apparatus, which enables them to live for a time out of water, and they travel by leaping, in immense squadrons, with their heads invariably pointed towards the nearest pond, being directed by a wonderful instinct. Other fish, similar to these, when reduced to the same extremities, by the drying up of the elements so indispensable to their comfort, dive deep in the mud, where they remain, almost consolidated into stone, for several months, awaiting the return of the rainy season, which awakens their vitality, and mercifully provides them with the means of escape? Can we contemplate, without surprise, so complete a change as this? Who is not animated with a great desire to understand this mystery, and resolve the queries which so wonderful a phenomenon naturally suggests? What extraordinary revolution extends over this living fish, and produces for the time, such an extinction of the powers of life? What potent spell retains in combination for so many months the multifarious elements of that organization, which, on being released, immediately resume their exquisite attractions, and again enter into life, full of perception, activity and sensation, enjoying the privileges of living in both water and earth? The water is probably more profusely peopled with a greater diversity and variety of strange, beautiful and monstrous inhabitants than the earth, from the immense oceans, to the most minute puddle; every portion, and I may say, every particle teems with animated beings. Several thousand aquatic species are well known, but

many millions have not been seen by man, and never will be. Even among the terraqueous insects, I meet with specimens daily, that I never saw before; every plant has its appropriate inhabitant; every bird its peculiar parasite, and every parasite a parasite preying upon its vitals, and when they die, their carcasses are immediately reduced to skeletons, by an army of unseen dissectors, that swarm everywhere, enjoying themselves in the earth, waters, and under the earth. There is no place so fetid and unclean, that is not at some time purified by either constant or nomadic insect inhabitants to gratify their passions, and at the same time promote the good of the whole animated system, making harmony from discord, and bringing forth universal joy from destruction and death. The air we breathe is filled to repletion with infinitesimal insects, which we swallow at every inflation of our lungs.

The object of God throughout the entire world is to balance the numbers of all the different kinds of animals, from the monod, that cannot be perceived by the naked eye, to the monstrous whale, so that a proper proportion, as far as numbers are concerned, may be preserved in quantities sufficient to accomplish the design for which they were formed. And as the meanest animalcule becomes the food of thousands of fish, as well as the grandest and most gigantic animal, the whale, so it was created devoid of a digestive nervous system, and is therefore incapable of suffering pain.

SMELT (*Osmerus eperlanus*),

Is a very small but most delicious malacopterygious fish, much resembling, in many of its habits, the salmon. It enjoys the salt water, particularly in the vicinity of the mouths of rivers. Its mouth is filled with long pointed teeth, the eyes are large and body long; they spawn early in April, and then return to the sea. Shoals of the young fry are seen leisurely swimming about the harbors from the Hudson river to Labrador, during the early part of August. Fresh smelt may be immediately known from the fact that they smell precisely like a cucumber when first taken from the water. It is green on the back and silvery on the sides—the scales are large, oval, and concentrically striate. The head is more than one-fourth of the entire length, smooth and sloping; nostrils large, contiguous and double. The ovaries present a bright yellow color, and, what is singular, they have no cœcal appendages, which are common in those found in Europe. They are generally from four to six inches long, though individuals have been caught twelve inches in length.

When taken with the hook and line, the bait used is a piece of their own species, for which they appear to have a great fondness, and if one is thrown among them whole, they will immediately gather around it, forming a complete circle, with their heads down, and bodies raised at an angle of forty-five degrees; two or three appear then to act as sentinels, and drive off any others that may approach. Some years since they entered the river Thames in such vast shoals, that more than two thousand persons, men, women and children, became anglers for them, between Greenwich and London bridge.

The sand smelt (atherina presbyter) is frequently sold as the true smelt; it can be distinguished by its odor, which is that of the violet; the flesh is hard, dry, and every way inferior to the cucumber variety. It may be much improved, however, by being cooked without embowelling. These fish are prepared and sold in England as anchovies, and to give them the requisite red color, red lead, cochineal, or red bole are used.

THE HERRING (*Clupea Harengus*).

I have not been so successful with this remarkable fish as with many others. They die the moment they are taken from the water. The head and mouth are compressed, the jaws unequal and short, the tongue rough and short, teeth inverted, and gill-covers contain generally four plates. He is of an ash color on the back, and his sides are white and silvery. This family of fish, as far as numbers are concerned, exceeds all the rest of the fish in the ocean put together. They penetrate to the Polar sea, inaccessible, on many accounts, to voracious fish, and there breed and multiply beyond the computation of man. It was supposed, by Pennant, that if two herrings were allowed to live and increase in their characteristic style, and the lives of their offspring spared for twenty-five years, their bodies united would exceed the bulk of the world ten times. An army of them, equaling, in extent, Italy, France and Spain, leave the regions of the pole in the spring. And when I contemplate the aspect of their northern home, bleak, dreary and beaten by tempests, so detrimental to life, I am filled with surprise that those regions should swarm with animal life possessing power to defy the rigours of the climate, and thus affording an abundance of food for all the inhabitants. One mile square of the Greenland sea contains 14,444,000,000,000,000 of medusan animalcules. Early in June, they surround the Shetland Islands; next Scotland, Ireland and England; then cross the Atlantic to the coast of Georgia, from thence they move east, and line the entire sea coast of North America, more than three thousand miles in extent; and what is most remarkable, keep the same distance from the sun, never rest, and are always compelled to remain near the surface of the sea, as their air bladders are too fully developed and their fins too broad to permit them to sink deep. We can scarcely conceal our amazement at the number of these fish, when we take into consideration the thousands of millions that are yearly taken throughout the world by fishermen, the tens of thousands of millions destroyed by whales, and other marine monsters, that follow them night and day, throughout all their migrations. In Holland, many years since, one hundred and sixty thousand persons were engaged solely in taking them. In Yarmouth, England, sixty-two thousand barrels are caught and cured annually. Eighty-three years ago, four hundred and thirty thousand barrels were exported from Norway, and seventy thousand barrels of herring oil from Sweden; and yet, notwithstanding the untiring activity of these numerous destructive causes, every ensuing year finds the abundance undi-

minished and perfectly inexhaustible, defying the combined arts of men and the irrepressible voracity of all the ocean tribes.

It is singular that the herring selects, for a leader and king, a cartilaginous fish, known as the sea ape (Chimœra Monstrosa), who always leads the shoal; the largest and strongest herrings come next, followed by the mass. Their progress is invariably indicated by sharks and sea-gulls. Besides they omit an oily matter, which covers the entire shoal, and may be distinguished at a great distance, as it causes a calm, and, at night, presents a luminous phosphoric light.

They select, for spawning ground, a coast abounding in stones covered by marine plants. Against these they alternately rub themselves from side to side, moving all the while with great rapidity, closely followed by the males, ejecting milt, during which process their fins are in constant motion. The skeleton of the herring, I find, is not as simple as many other fish that I have examined, from the fact that it possesses a sternum to which the rib bones are attached below, corresponding to similar bones of terrestrial animals; in them it is formed of nine elementary pieces, each proceeding from an individual center; but in the herring, it is rudimental only. The frame work of the herring's skeleton has not by any means the compactness that we find in reptiles; the parts which compose it are not firmly joined together, and consequently their elementary parts are detached from each other, appearing as if the process of consolidation had been interfered with for some unknown purpose, at an early stage of their existence. The texture of their bones seems to be composed of calcareous phosphate in a granular form, appearing much like coarse fibers. The ventral and pectoral fins of the herring, correspond with the arms and legs of man.

The genus clupea is very nearly allied to the genus salmo, and they are included in the same family; the chief external difference appears to consist in the absence of the adipose dorsal fin in the herring.

In the salmon tribe, the maxillary and intermaxillary bones enter into the formation of the mouth, and are armed with teeth. There is a large air bladder in the herring, and many pyloric appendages complicate the duodenum, which would prevent them from seeking the depths of the ocean, as has been supposed, after depositing their ova; their eyes are likewise unfitted to bear pressure. There are several varieties of this fish, each of which spawn at different periods of the year, in June, October and February. The herring may be considered one of the most capricious fish that swims, as there is not a fishing station scarcely, either in this country or Europe, that has not experienced great variations in its visits, both as to numbers and time. Benjamin Franklin observed, in Connecticut, that herring annually ascended one river from the sea, but never another, separated, by a narrow neck of land and communicating also with the sea. He was surprised, and took the leaves of a tree, on which ova had been deposited and fecundated, and placed them in the river that had always

been deprived of the annual visits of the herring. The following year they were numerous, and have so continued ever since.

The proper time to fish for herring is at night, particularly when drift nets are used for the purpose, as they are easily frightened, and if the shoal becomes thoroughly alarmed, they make off from the coast or river with incredible rapidity. A dark night and light breeze favors their capture. As an article of diet, when preserved, they are entirely too oily to form a healthy aliment, and should be used in moderation, except by those endowed with strong digestive powers ; but in small quantities they are far from being objectionable ; still they invariably excite thirst, and in some constitutions cause fever. It is however incumbent upon man to cure the superabundance of herring at one season, to be prepared to meet the exigencies of another, or we might be subjected to deprivations. For this purpose, salt, which possesses wonderful powers of preserving animal matters from putrefaction, is generally used, and necessarily in larger quantities than is beneficial to the health of the consumer, as is shown by the scorbutic diseases and other peculiar complaints those persons are liable to who feed much upon salted herrings, or other salted provisions. The reason is that salt corrugates and renders dense the fibrin, deprives the albumen of its water, and impairs its nutritiousness. Herring should be salted, in warm weather, immediately on being taken. If kept a few hours they become tainted, when they will not take salt. If the weather is cold, and circumstances prevent immediate salting, which is preferable, the fish become tough, and must be hung up for three days, at the end of which they should receive salt.

When taken from the nets, cut them open and remove everything except the roes and milt ; then wash them in fresh water, and place them in vessels containing strong brine for fourteen hours ; after which they may be packed evenly in rows, pressed down, and salt strewed between each row. The Dutch, who are supposed to be the first people engaged in the herring fishery, preserve them by pickling and smoking as well as salting. Sugar is a great preservative of fish, and even molasses will keep them for months after two immersions in it, and for years, if perfectly dried afterwards. If you use sugar, open the herring as for salting, and rub the sugar in thoroughly, with a small portion of saltpeter ; air them for a few days, and pack as before described—first a layer of fish, then sugar, &c. Herring thus preserved, when dressed, will be pronounced far superior, and of finer flavor than either salted, pickled or smoked.

Next to this mode I prefer smoking, as it imparts a delicious flavor, and preserves the juices more perfectly than salting, Beech and oak wood are preferable for this purpose to any other. You may impart any flavor you choose by the use of aromatic wood. The reason why we all give the preference to Westphalia hams, is, that they are smoked slowly by juniper wood. The theory of preserving by smoke is, that a vapor called pyroligneous acid rises with it, and causes preservation. It may be called the es-

sence of wood, and is the same as the ascetic which forms the sour principle of vinegar.

Speaking of salting herrings, reminds me of a story told respecting the angling of Mark Antony and Cleopatra.

He went out one day to angle with her, and being so unfortunate as to catch nothing in the presence of his mistress, became much vexed, and secretly commanded a fisherman to dive under and place fresh caught fishes upon his hooks. After he had drawn up four or five, Cleopatra observed the trick, but pretended amazement at his good luck and dexterity; told it to all her intimate friends, and invited them to come and see him fish the next day. The consequence was, a large party accompanied them in the fishing vessels, and Mark Antony let down his line, when she ordered one of her servants to dive and fix upon his hook a salted herring from the Euxine sea. Shakspeare introduces this story in his "Antony and Cleopatra," act II, scene V.

HADDOCK (*Gadus Æglefinus*).

I have failed to fresh-waterize this well known fish. Like the cod, it is a native of the northern seas, where it congregates together in mighty shoals, and starts at stated seasons to visit certain coasts, in such numbers as to form a shoal twenty-five miles long and four broad, generally in pursuit of the herring; and they, in turn, are followed and devoured by sharks and other fish of prey. The haddock will eat human flesh, or that of drowned animals. It has a robust body, tapers behind, and is large in front; the length of the head to the total length, is as four to one; the scales are small; the eyes are placed near the facial outline, and are large Below the lateral line the color is a silver gray, above a dark brown; the pupils are black, irides blue, mixed with red. On each side there is a large black spot, which superstition assigns to St. Peter, as the mark made by his finger and thumb when he extracted the tribute money from a fish of this species, which has been continued to the family of haddocks ever since this wonderful miracle was performed. That the reference to St. Peter is entirely gratuitous, is indicated by the fact that the haddock has never been found in the waters of the country where the miracle really was performed. Moreover the sea of Galilee is a large sheet of fresh water. This fish is as common as cod in the New York markets, but far inferior as food. In Massachusetts they are often used as manure. I am led to believe, from several experiments, that the haddock is a viviparous fish, and fully develops the embryos in the ovary, which are probably brought forth in a sack. I think the cod is also viviparous, as well as the hake.

They sometimes grow to the length of three feet, when their flesh becomes tough and coarse; those about fourteen inches long are firm, and possess fine flavor, particularly those cured at Fordhorn, near Aberdeen, in Scotland. They are split, dried two days in the sun, and then hung upon wooden spits, in large chimneys, and there smoked from a fire made of sea weed, sufficiently to give them a smoky flavor. An imitation is made in

London, by salting haddocks for five hours, splitting and soaking in pyroligneous acid for half an hour, and then drying.

They may be pickled in vinegar, thus: Take them fresh from the water, and cut them into convenient sized pieces, with the scales on; prepare a strong brine that will buoy up an egg, and boil the haddock in it, with some alspice and whole pepper. When boiled sufficiently to be readily perforated by a pin, drain off the liquor and pack them in shallow casks, covered with the brine and good vinegar in equal proportions. Let them stand thus for two days, then consolidate them, and head the casks.

In the month of January, shortly after the immense army of herrings break from the frozen depths of the Arctic ocean, the haddock, likewise, tired of its winter home, follows in pursuit, and passes between the North Cape and Greenland in such dense columns as to darken the whole face of the waters. They follow certain larger haddocks, who are selected to lead the shoal. These are called kings by the Dutch fishermen, and when taken are religiously returned to the ocean, fearing that if deprived of their leaders the nation of haddocks would not again find their way to their accustomed coasts. The moment this great shoal emerges from the Greenland sea, they divide into two great armies, one directs its course to Scotland, Ireland and France, and the other finds its way to our shores. In July some unknown and yet to be discovered impulse suddenly causes these advancing shoals to stop short in their onward career, and retrace their course towards the Arctic ocean, before reaching which they meet the other band at some chosen point of rendezvous, not yet discovered by man, and on the twenty-fifth day of September may again be found at their winter quarters beneath the frozen waters of the pole. Between the time they left it and their return, they have not remained stationary for one moment. The object of God in leading the haddock and other migratory tribes of fishes this annual round, is no doubt that of furnishing food to man and animals.

It would afford me intense pleasure if I could discover what gives the first impulse by which they are compelled annually to leave their home, at a period of the year when it abounds with food precisely suited to their tastes. I imagine they are directed by instincts, which lead them to desire a remote and secret place to deposit their ova.

Infinite wisdom is shown in the object and end of all the physical laws and organizations which govern all animated nature, by construction, contrivance and adaptation, thus filling the waters, and the atmosphere, with beings beautifully and perfectly contrasting with one another, as the birds and fishes do. Both sprung from precisely the same element, move in their own ocean, with analagous organs, differing in number, substance and structure, but with the same end in view, to propel, guide, elevate, and sink them. There is not a particle of difference between flying and swimming; the bird flies in the atmosphere, and the fish flies in the water. The scales of the fishes are analogous to the feathers of birds; the fins to the wings, and the tail steers both. The birds enjoy the entire atmosphere of the globe, and the fishes the boundless depths of the sea, making their habi-

table world about equal. As far as rapid motion is concerned, birds must yield the palm to fish. The eagle cannot compete with the shark, or the swallow with the haddock, though both their motions are graceful and beautiful.

The form of fishes is better calculated for easy and rapid movement, than the form of birds; and the resistance of the water in which they fly, does not impede their rapid progress, as the atmosphere does that of birds. Birds, when the wind blows, are compelled frequently to alight, in order to renew their strength, and invariably indicate, by panting, signs of fatigue. Fishes never show that they are fatigued, and require no time for repose. The whole organization of a bird is completely filled with air—the bones, cellular tissue, feathers and lungs—affording them a specific levity enjoyed by no other class of animals in the universe; and many have a gland secreting oil, which they use to cover their feathers, and thus repel excessive moisture.

Fish have an air bladder, which is admirably adapted to their wants.

THE COMMON COD (*Gadus Morrhua*).

I have failed to accomplish any good result with this fish in fresh water, as yet; still I propose to continue experimenting until success attends my efforts.

The cod is covered with loose, soft scales, and has soft ventral fins; the air bladder is large, and teeth are arranged in unequal rows. He is confined to cold climates, and found in prodigious numbers in the northern parts of the globe, principally between the latitudes of 45 and 66; those taken north or south of these latitudes are inferior in quality and size. They are never seen in the Mediterranean. The banks of Newfoundland, Nova Scotia and New England, abound with them; they are also taken on the south and wests coasts of Iceland, Norway, in the Baltic, and off Scotland. They spawn on rocky ground, and recover after it sooner than any known fish. When out of season they lose their plumpness at the tail, and the inside of their mouths will be found infested by insects; the head and shoulders are the choice portions of the fish, and should be eaten soon after he is taken, as it loses flavor in twelve hours. The flesh of the cod is white, rich, firm, and extremely nutritious. He possesses the power of compressing his air bladder, and thus condensing the air to such a degree that his specific gravity becomes much heavier than water, and he sinks rapidly; when he desires to rise, he relaxes the muscles connected with his bladder, causing the air within to be expanded, when he immediately becomes specifically more light than the water, and ascends. The flounder, sole, eel and numerous other fish have no bladders, and are therefore compelled to remain always on the bottom. The cod is gregarious, and traverses the ocean in immense squadrons, remaining in certain localities as long as they yield appropriate food in sufficient abundance to supply his wants; he is particularly fond of certain marine plants, muscles, sandworms and snails. The cod can never be caught by the flesh of his own

species cut up for bait, as many fish can. If stale bait is used, he smells it at once, and flees from it rapidly. This fish is regarded very justly as a source of commercial wealth and national industry, as well as a wonder of nature, in its continuance to multiply as it does, notwithstanding the myriads that are destroyed by the agency of man, also in the egg shape by ravenous fishes, and even by their own gluttonous parents, clearly demonstrating that without extraordinary creative power the species could not be protracted long. But nature has endowed this race of fish with the most remarkable fecundity, as careful and oft-repeated observation has shown that the ovaries of each full grown cod contain, on an average, nine million three hundred and forty-four thousand ova, and if neither man or predacious fish made it their food, would so fill the ocean in a few years, as not to leave space for the motions of life of any other marine creature.

Their flesh is composed of firm, white, flakey muscles, and forms a wholesome diet, either fresh, salted or dried; the tongues and bladders, salted or pickled, are considered a delicacy by epicures; the liver is delicious, and affords a limpid oil, now well-known to commerce; the head is principally composed of gelatine, and is considered the most nutritive portion of the fish, and would furnish a large percentage of isinglass, or glue, if properly prepared; the intestines are eaten by the French, and considered a luxury, and the roes, when pickled, are exceedingly fine.

Before the American revolution, there were employed in the Massachusetts cod-fishery, nearly thirty thousand tons of shipping, and more than four thousand seamen; the value of their industry annually, was about eleven hundred thousand dollars. It is an interesting fact, well established, that our unsurpassed system of common schools, took its rise in the Plymouth fisheries in 1662 or '63, when the colony court passed a law that all the profits annually accruing to the colony, for fishing with seines, nets, &c., should be devoted towards founding a school for the training of youth, and it was established at once, and supported by the proceeds.

It is a fortunate circumstance that the poor cod fish has been so constructed, as not to feel pain when dismembered by the loss of a fin, the tail, or even a portion of flesh, and I do not believe any cold blooded animals do. What a kind provision this seems to be, when we take into consideration the huge monsters of the deep that swallow them by thousands, with never sated appetite, which surpasses all our powers of conception, and besides these extraordinary and grotesque monsters of the deep devour all carcasses floating in the ocean, thus purifying and disinfecting it; precisely the same as vultures and hyenas, their terrestrial counterparts, do upon earth.

The eye of the cod fish is complex to an extent that no one would dream of, and is well worthy the study of the most learned and scientific among men. The central part is as transparent as glass, and when examined under the microscope, presents to view the most perfect and extraordinary conformation, and though not so large as a buck shot, is composed of more than four millions of distinct fibers, locked together by millions of teeth,

and covered by an infinite number of concentric layers, which increase in their density from the surface to the center. The cod has a distinct cornea, exterior to the iris and lens, possessing a small degree of convexity; the refractive power, therefore, is small, and he consequently depends mainly upon the crystalline lens for the necessary refraction. There is an organ in the choroid gland, which covers the optic nerve, formed very much like a colt's foot, of a blood red color, and almost vascular, that I can imagine no possible use for. The eye ball is encircled by very strong muscles, by means of which this fish can elongate or contract the axis of the eye, changing the distance between the cornea and retina, as a spy glass may be shortened or extended to adapt it to the proper distance to view any object. They sometimes grow to a great size; one was taken at Scarborough, five feet eight inches in length, and weighed eighty pounds; the usual weight is from twenty to forty pounds.

It is wonderful to observe what discrimination and acuteness the cod exercises in the discovery and selection of its food, leading one to imagine that they possess peculiar powers of conception, and if they do, it is probably through the medium of a tubular structure immediately under the skin, on the top of the head, connected with the brain, the use of which, I am at a loss to discover. In fact, all bodies that possess life, present to my mind a succession of complicated phenomena so anomalous as to be irreducible to any law. When I go to my ponds, and direct my attention to the animated existence displayed in endless variety beneath their waters, all possessing the wonderful power of spontaneous action, acted upon by desires and passions, besides being fully endowed with capacities of suffering and enjoyment, I am filled with profound astonishment. But when I go farther, and examine the water in which they dwell with the microscope, and find it peopled with countless millions of atomic insects, all provided with appropriate organs, powers of motion, procreation and individual vitality, together with the means of maintenence in inexhaustible supply, I am overwhelmed by the wisdom, power and goodness of the Almighty.

HOLIBUT (*Hippoglossus*).

The body is a dusky brown above, and perfectly white beneath. It grows to weigh in the northern seas more than four hundred pounds, and is exceedingly voracious, devouring indiscriminately haddocks, rays, crabs, oysters, clams, and the lump fish, sometimes called the sea owl, which is rather a formidable fish to swallow, as it has a sharp back, and rough skin covered with tubercles.

I think large holibut a coarse fish, except the portion near the fins, which is tender, fat and delicious. The Greenlanders cut the whole body into long thin strips, which they dry in the sun for winter consumption. They spawn in May upon rocks near the shore, to which they attach their ova with some glutinous matter ejected upon them by the male, with the milt. The organ of smelling is large in this fish, and it possesses the power of dilating or contracting the entry of it as it pleases; it will discover food,

when first thrown into the sea, at a very great distance, and that this is not accomplished by sight, is evident from the fact, that after it has remained sufficiently long in the water to be deprived of its smell, it will not approach it; and notwithstanding its mouth appears so small, swallows with ease very large fish. It is particularly fond of all the zoea family, which are animals that are metamorphosed from the ova of the brachyurous decapodes.

GRAYLING (*Salmo Thymallus*).

This fish resembles in some particulars the herring. In Switzerland they are considered one of the choicest fish, and in Italy, during the month of January, they are particularly valued, and sell for a higher price than any other fish, the trout not even excepted. The French think so much of him, that they say he feeds on gold, especially those taken in the river Loire, and they may well think so, from the fact that grains of gold are often found in those taken.

When fresh caught they smell precisely like thyme; St. Ambrose, the time-honored bishop of Milan, called the grayling the flower of fishes, and when dining upon one, always honored him with a long discourse. Abroad the grayling may always be found in trout streams, and are taken with the same variety of bait; they are a bolder fish, and afford fine sport to the angler. It is shaped much like a trout, but somewhat longer and more slender; they are often taken from fifteen to eighteen inches long. It is an admirable fish to be kept with trout, as it is in season during the winter months; its flesh is perfectly white, delicate and firm, and the flavor exquisite. It is supposed in France to be a migratory fish. This is an error, for they cannot endure salt water. They are not readily taken without a boat, for which reason those who are in the habit of fishing for them, carry with them a corbula or basket, shaped somewhat like the half of an English walnut, and covered on the outside with hide. It has a seat in the middle, and will only contain one person; when traveling from one stream to another, they hang it on their heads, and carry the paddle, which is used instead of a cane. When launched, there is great difficulty in getting in it, and when you are in, it is more difficult to prevent it from turning over.

PILCHARO (*Clupea Pilchardus*).

This fish is a species nearly resembling the common herring, but shorter, thicker and rounder, and is better known abroad than in this country. The head is flat, mouth destitute of teeth, abdomen and sides silvery, back blue, and on each of the gill covers there is a black spot. These fish make their appearance on the English coasts in immense shoals about the first of July, disappear in October, and reappear in December. When a school approaches the shore to spawn, they are surrounded by a seine, and twelve hundred tons, or four thousand three hundred hogsheads are often taken at a haul, and are said by English fishermen to be greater in number and gain than any fish taken from the sea. When landed they are

piled up in cellars and salted; after remaining about one month in this state, they are cleaned, washed and packed in large casks containing nearly three thousand fish each. Pressure is then brought to bear, and three and a half gallons of oil are extracted from each cask. Some of these fisheries produce one hundred millions of fish per annum. Its geographical distribution is far more limited than the herring, occurring only in Great Britain, in immense numbers on the shores of Cornwall and Devon. It is found in the Mediterranean, and also on the coasts of Dalmatia, from whence it is exported into Italy and Greece. Their appearance at particular places, and term of remaining, is somewhat uncertain; but when they come, the shoals are so enormous in numbers as to exceed belief. They furnish food in abundance to the lower classes, and are often used as a fertilizer by the grape and hop grower; but I must say that there is nothing so annoying to the traveler as to pass through a district where they are used for this purpose. The stench and putrid effluvia often causes fevers. Its food chiefly consists of sea worms, small fishes, and a crab, cancer palecum, which abound in the northern seas, the red ova of which so injures their spawn as to render it unfit for preserving. After depositing the ova, their stomachs remain empty until they again reach their northern feeding grounds. They are the prey of many cetaceous animals, sea fowl, and numerous fishes. So it seems that all animated nature, having received the gift of life, must obey the unchangeable law of mutation and be demolished, that other beings may in turn partake of the inestimable blessings of existence, and they must give way to a new race of successors to pass through the everlasting cycle of mutations and renovations, that the multiplication and continuance of every species may accomplish a certain part in the system of living nature. God has established laws which will always insure the perpetuity of every race in all portions of the habitable world, by transforming one living being into another. No animal, vegetable, or insect, however insignificant they may appear, fails to have some part in the system assigned to it. No fabric achieved by the hand of man ever approached even the eye-ball of this little fish, which, though smaller than the smallest pea, contains four millions of fibers, which lock into one another through the means of five hundred millions of teeth. How complicated must the other portions of the eye be, having as important duties to perform.

THE MACKEREL—(*Scomber Scomber*).

This fish is well known to be, in form, one of the most beautiful among the finny tribe; its colors, when fresh from the sea, are truly splendid. It is supposed, like the herring, to be migratory; spending the winter in the northern seas, and visiting the south to deposit its spawn. There are twenty-two species of this fish, the one best known in commerce, has a smooth, compressed head, and several spurious fins between the caudal and dorsal fin, and is generally twelve inches long; they have transverse dark blue stripes, richly shaded with a tinge of green, extending from the dorsal fin. The males have black spots on the sides, fading into a yellow-

ish green, that artists find great difficulty in imitating. Among edible fishes, the mackerel has, from the remotest antiquity, maintained a very high rank. It is said that a Roman Consul once paid for a single one, when out of season, $216. They are uncertain in their movements, and fail sometimes to make their appearance on favored coasts, as has occurred this year. Three mackerel have been taken in a cruise of sixty miles, where last year, hundreds of barrels were secured.

Their greatest enemy is a fish known as the tunny, (*Scomber Thynnus*), which follows and devours them voraciously. "Pliny, the naturalist, gives an account of a shoal of tunnies, following a school of mackerel, so vast that the fleet of Alexander the Great could not maintain its course through them, until the ships were arranged in battle array, to force the extraordinary aquatic phalanx to give way to the conqueror of the world."

This delicious migratory fish always supplies our tables with a very acceptable treat, when the cod fish is out of season. The mackerel is a thoracic, as all those are, having their ventral fins located immediately below the pectoral.

It is one of the most widely dispersed fish that we have, being found in the Atlantic, Mediterranean, Antarctic and Arctic oceans. It hybernates in the Arctic, where it selects sheltered, land locked portions of water, that are always calm, and of different depths, with a muddy bottom, covered with marine plants; a film covers their eyes; and here they pass the winter, and in the spring proceed south to deposit their spawn, five hundred and twenty-five thousand of which have been counted in a single female. The moment they are taken from the water they die, emitting a phosphorescent light. It was this fish that the Romans used for the purpose of making a pickle they called garum, and Pliny said they were good for nothing else, never having discovered their good qualities as an article of diet.

Caviare is made from the ova on the Mediterranean coast, fully equal, if not superior, to the Russian caviare, made from the roe of the sturgeon caught in the Caspian sea. The dorsal fins are sustained by numerous slender bones joined to the spinous portions of the vertebræ, forming centers of ossification, and are called rays, and in order to lessen danger if they should happen to become fractured, they are divided into sundry pieces, affording a great degree of flexibility. The anal fins are in the vertical plane next to the tail, and are likewise supported by rays; the caudal fin is constructed similarly. The muscles of the mackerel form two-thirds of the bulk of the body, and produce the flexion of the tail. The disposition and arrangement of the skeleton is such as to dispense with the long tendinous cords often found in fish; and the fibers are oblique to the motion, which affords great advantage to the velocity of action. No fabric ever achieved by the utmost efforts and ingenuity of man, approach in the slightest degree, the apparently simple structure of the mackerel, which in all the internal mechanical configuration and elaborate organization is artificial

and complex in the very highest imaginable degree, showing wonderful elaboration and marvellous workmanship, surpassing all our powers of conception.

The *Tunny* deposits its ova along the shores of the Mediterranean in the month of June, and approaches them for that purpose in immense shoals, arranged somewhat in the form of a parallelogram, making a terrific noise. It is a large fish, averaging three feet and a half in length. The flesh is perfectly delicious, and more nearly approaches the flavor of animal meat than any other known fish. It is more firm than the sturgeon, and infinitely superior. It has eight finlets below and above. The abdomen is silvery white, and the back a dirty blue. They are exceedingly voracious and fierce, preying indiscriminately upon all varieties of fish, but particularly on the mackerel. It is gregarious in its habits, and visits the American, Indian and Northern seas. The small fish are sold fresh, and the large ones cut up and salted for exportation. They are characterized by having small scales, covering, comparatively speaking, a smooth body, and a tail possessed of immense power. They may justly be considered of the greatest importance to mankind, on account of their size, flavor and abundance. They swim at the rate of seventeen miles an hour, and pursue their course without apparent intervals of repose, sleeping, no doubt, while in motion, with eyes always open to see the infinite variety of singular, grotesque and extraordinary fish, representing every aerial and terrestrial form, which they may either seize or avoid at pleasure.

THE STURGEON (*Aceipenser*).

This remarkable fish much resembles the shark, and is covered with bony prominences ranged in logitudinal rows ; the nostrils and eyes are on the side of the head ; the snout projecting ; body long and slender ; mouth small and devoid of teeth. It is an amazingly strong and vigorous fish, and continues to grow until it reaches twenty feet in length. It is mild and inoffensive, and feeds on worms and animalculæ. Its bones are entirely cartillaginous ; its flesh is much esteemed by many ; it is delicate, the color of salmon, and when properly cooked nearly resembles veal. It was in high repute among the Romans and Greeks, and was brought to the table with great pomp, ornamented with flowers and accompanied with music. Caviare is prepared from the roe, and used as an article of food during the Lenten season of the Greek church. After this is extracted, as well as the isinglass, the carcasses in many instances are thrown away, and permitted to rot and taint the air for leagues. Under the mouth there hang pendent four cirri, which so much resemble worms that frogs, and occasionally small fish, nibble at them, and are at once seized and swallowed. The tail is its propelling instrument, with which it operates upon the water precisely like an oar when sculling a boat. The other fins are called into requisition in balancing, turning around, and stopping suddenly ; the fin on the back, near the tail, performs the interesting office of keel, which is placed underneath on boats. Were it so placed on the sturgeon, he could

not feed on the bottom, and might ground in shoal water. The gills of this fish fulfil the office of lungs; their fringes are so constructed as to subject the venous blood to the action of the water, which is driven through them forcibly by the motion of the jaws. I once closed the gill covers, and death ensued in a very short time by suffocation; and on another occasion fastened them open in such a manner that the mouth could not exert a pressure to react on the water, and death happened immediately.

The mouth of the sturgeon is a complete force pump, and is constantly employed driving water through the fringes of the gills with great force. The mouth of the lizzard, frog and toad may be called a bellows, by means of which the animal forces air into its lungs, which are composed of long, narrow cylinders, extending from one end of their bodies to the other. All animals that breathe atmospheric air have two hearts united, called a double heart, one of which throws all the blood into the lungs, and the other forces it through all the arteries in the body; both are force pumps, and both have valves. Fish are cold-blooded, and have but one heart of the gills, which answers the same purpose as the heart of the lungs in animals. Whales are warm-blooded, breathe air, and are, therefore, supplied with a heart and lungs, but no gills; consequently a whale is not a fish. A fish cannot breathe air or water alone; they must be mixed, and therefore it would seem to follow that a fish is not an animal.

The digestive apparatus of the sturgeon is simple and complete, and is capable of secreting gastric juice very rapidly, and in great abundance. To prove this, I killed one five hours after he had swallowed a frog, but there was nothing remaining of it in his stomach except two small bones.

This is one of the principal migrating cartilaginous fishes, which gives support to thousands of persons at certain periods of the year. There are two species, the one called Accipenser sturio, and the other Accipenser huso. The last is to be found only in the Black and Caspian seas, the Volga and Don rivers and their tributaries. They are far larger than the sturgeon, having been known to weigh nearly three thousand pounds, and to exceed forty feet in length. Its ordinary length is about twenty-four feet. It is far more numerous than the sturgeon. The ova are manufactured into a delicious species of caviare, superior in many respects to that made from the latter. One-third of the whole weight consists in spawn, which will give some idea of the enormous power this fish possesses of production.

They are taken in large quantities by the Tartars in the Volga, and notwithstanding they have been and are considered more ignorant of science and art than almost any other people, still they show as much genius as any enlightened nation in their mode of taking the huso. It enters the Volga to spawn about the first of December—much earlier than the sturgeon. At this period the Tartars drive piles through the ice across certain parts of the river, in such a manner as to form triangles, with the angles opening into a room made with hurdles, having a movable bottom. The huso, on his way up the stream, inadvertently enters, when the opening is

closed by means of a drop door, and the fish raised to the surface on the false bottom.

In the neighborhood of Astrican there are immense caves lining the sea shore, in which immense shoals of huso take up their winter quarters. At this period all the neighboring fishermen assemble, and appoint a director and several inspectors, to whom is delegated power and authority to command the operations. When everything is in readiness, they take to their flotilla of smacks, and preserving perfect silence, enter the winter quarters of the huso. At a given signal from the director, a universal shout rends the sky, and instantaneously the amazed husos, in the greatest imaginable fright, fly from their secret recesses, and are intercepted by the nets. This fishery is chiefly important on account of the caviare made from the ova, carriage covers with the skin, and the isinglass prepared from their air bladders, which is universally celebrated throughout the world, and is of great commercial value, not more so, however, than the caviare, which forms the chief food during the long fasts in the Lenten season among the Greeks, Turks and Russians. Lewenhoeck estimates that there are one hundred and fifty millions of ova in a single female, instead of one million six hundred thousand, and when we take into consideration the vast multitudes that ascend all the estuaries of the large rivers in the east to spawn, we need not be astonished at the amazing increase of the huso.

Surprise has been expressed by gentlemen who have given attention to icthyology, that I could so readily fresh-waterize salt water fish. Now, the fact probably is, that all fish were originally inhabitants of salt water, but the Deity, having implanted in them habits of wandering, they have been gradually dispersed throughout all the waters tributary to the great oceans, and carried by birds to every pond, pool and lake on the face of the earth, which teemed with countless millions of organized insects, eternally propagating their species to supply them with food. Man, animals and fish can at all times change their residences and become acclimated to any locality. When fish make these changes, it becomes very difficult to note with fidelity the alterations that frequently take place in their color, season of breeding, &c., involving the natural history of this creature in much obscurity.

THE MOSSBONKER (*Alosa Menhaden*).

I am endeavoring to breed this bony, hard-headed fish for manure. The top of his head is green, and his sides silvery white; he is immediately recognized by a dark spot on the shoulders, just behind the opercles, and there is a transparent space behind the eyes that you may look through and see any opaque substance on the other side. Scales cover the fish in such a manner as to present the appearance of a sheath, and what is more singular still, the fins are enveloped with them. The stomach is covered inside by a very black substance, and the intestines are convoluted. The meat may be eaten; it is excessively dry, and filled with bones, without possessing the least flavor, and seems intended by the Creator as a manure,

for which purpose it is the most valuable fish that swims, and is one of the chief sources of wealth to the inhabitants of Long Island. For corn, they place three or four in a hill; for wheat, cover the field with them and plow them under; for grass, decompose them in the compost heap. When in the soil, they undergo decay, continually producing sundry substances in less or greater quantity—some liquid, some solid, and others gaseous—all hastening, some by one course, some by another, towards the destination they are all bound to reach—the nourishment of plants, and after a series of years, they are again resolved into the fishy forms from which they were originally derived, in precise proportion.

Its value, in my estimation, has a drawback, that leads me to think I never will be able to use it as an enricher; and that is its unhealthy and abominable smell, which may be perceived, if my olfactory nerves are true, the moment you reach the fish district; and I believe it to be the originator of fevers and other diseases that are known to exist in the neighborhood of those using them in the fall of the year.

From the 1st to the 10th of June, shoals covering immense areas appear near the shore of Long Island, with their heads partially above the surface of the water, thus stupidly indicating their whereabouts. One thousand fish are considered a wagon load, worth about two dollars, and eighty-six wagon loads have been taken at a single haul of the nets.

The inhabitants of Massachusetts pack and export immense quantities of them to the West Indies, and likewise use them as bait for holibut and cod. They are known by several names; the Dutch called them morse-bonkers, the Manhattans, panhagens; the Narragansetts, menhadens; and the people inhabiting eastern Long Island, skippangs.

I hasten the development of my house grapes very much during the sturgeon fishery in August, by burying large subjects in my borders, about eight feet from the stems of the vines, carrying out one of the laws of nature, by making dead matter support the living plant, and it intelligent man, thus binding them all together. My late friend, Mr. James F. W. Johnston, remarked to me shortly before his death, "that the time would probably come when the art of man would acquire a dominion over that principle of life, by the agency of which plants now grow, and alone produce food for man and beast, by the manufacture of those necessaries and luxuries for which he is now wholly dependent on the vegetable kingdom, and be enabled to tread the soil beneath his feet as a useless thing, to disregard the genial shower, to despise the influence of the balmy dew, to be indifferent alike to rain and drought, to cloud and sunshine, to laugh at the thousand cares of the husbandman, and to compassionate the anxieties of the ancient tillers of the earth." This cannot be the will of God, as it would decrease man's means of happiness and pleasure, which he has invariably shown a desire to increase.

Set him free from the necessity of cultivating the ground, and you deprive him of the delightful pleasures of a tranquil agricultural existence, the

enjoyments appertaining to returning seasons, health and happiness caused by labor in the sun's rays, and convert him into a manufacturer of the necessaries of life.

THE BLENNY (*Blennius*).

There are twenty-one varieties of this fish, the most remarkable is called the viviparous blenny. It has two tentacula pendent from the mouth, grows to the length of sixteen inches, has a slender form, slippery skin, covered with small, yellowish scales, pale beneath, and marked above with pale spots, forming bars across the back and dorsal fins. It frequents the coasts of America, Mediterranean, Baltic and Arctic seas, runs up the rivers, and feeds on insects, small fish, and marine worms of various kinds. Its eggs are hatched internally, and the small fish are extruded perfect in form. From two to three hundred have been found in a single female. Just prior to the extrudation, if the fish is touched ever so lightly, the young fry are excluded, and immediately swim off with considerable vivacity. It breeds twice in a year. Its flesh is perfectly white, flaky and oleaginous ; but seldom eaten, because the bones, like the gar fish, invariably turn green by boiling.

It bites readily, and is exceedingly tenacious of life, living from twenty to thirty hours out of water. Its flesh may be cut into long strips, dried and used as matches.

HUDSON RIVER SEA-HORSE (*Hippocampus Hudsonius*).

This little creature is about six inches long, having on the top of the head a large protuberance, resembling bone, ending in five points ; the nostrils are double, and eyes exceedingly prominent. It has a long, four-sided tail, blunt at the end, and is devoid of fins, with a body entirely made up of segments, protuberant and heptangular; the jaws are straight. When swimming, the hippocampus maintains a perfectly vertical position. It uses its tail to hold on to anything it may find in the water, and thus fixed, it darts at its prey and seldom fails to secure it.

THE SEA-MOUSE (*Aphrodita aculeata*),

Is peculiar from the fact that it has an intestine much longer than the body, and is folded many times within the body it occupies ; its dilatations may be seen in the animal through its transparent skin, and the food may be seen passing from one to the other of its several stomachs before digestion. It has a retractile probosis, which is furnished with four teeth, and thirty-two orifices on each side, opening into a large respiratory sac, situated beneath the muscles of the back, but separated from the stomach by a membrane.

There are fifteen vesicles on each side, without external opening, that receive certain tubes from the intestinal canal, which aerate the nutriment the moment it is prepared by the organs of digestion.

SEA-ANEMONES (*Actinia*),

Are marine animals that generally fix themselves on rocks, but have the power of locomotion. They send forth from their base stalks, each bearing apparently many petaled flowers of various hues, and appear from the surface like a bed of beautiful many colored flowers. There are other sea animals, representing the sunflower, daisy, pink and China aster, at the bottom of the ocean, making it appear like a garden of Eden. They respire and reject water, and, if they are divided at the base, are reproductive, after forming tentacles. The sea-anemones have a separate alimentary tube, enclosed by longitudinal muscles, and likewise several ovaries. When the sun shines in calm weather they expand their flowers to the surface, but contract into a mass of flesh upon indication of danger. They vomit up their young, and when desirous of changing their location, they detach and commit themselves to the protection of the waves.

There are other aquatic animals that have roots, branches, leaves, twigs, tendrils and flowers, that have been mistaken for flowers. They may always be known from the fact that plants receive their nourishment from roots at the bottom, whereas the animal plants take theirs from mouths at the top.

THE POLYPE

Is an aquatic animal inhabiting both salt and fresh water, and are numerous, not only in tropical seas, but high latitudes also. The marine polypes fasten themselves on rocks in various aspects, not liable to strong currents or heavy seas. They represent plants in all the intermediate stages from the seed to the tree, and put out branches which produce blossoms, composed apparently of petals growing from a calyx, and arranged in circles; are sensible to light, and turn towards it like the sunflower, and may be propagated by cuttings; consequently naturalists, not for a moment suspecting their animal nature, have generally looked upon them as plants. With regard to their reproducing powers, it is by germs and scions. The former issues from the body of the parent as a limb springs from a tree, the bud being a portion of her skin, and the stomach a portion of her stomach. When she partakes of food, it passes into them. After they have attained a certain degree of advancement, and put forth buds from themselves, the parent detaches them and they become animals. Thus a single individual may, in the short space of one month, have fifteen hundred thousand descendants, and though large portions of the ocean may be covered by them, there is no confusion or interference. They are so instinct with life that they cannot be destroyed. Cut them into segments as you may, each piece will at once become an animal, and within an hour form its tentacles and tubes, and be prepared to catch and digest food. You may then turn them inside out without affecting their vitality in the least, or arresting their propensity to eat. They feed upon anything and everything that they can lay their tentacles upon, be it fish, slugs or worms. When they have secured the object, they contract and bend the tentacles until they reach their anterior extremity, which is the mouth.

THE HYDRA.

This creature, like the polype, is adapted to digest food through the medium of a simple tube. It has neither brain, heart, organs of sense or nerves; is voracious, and swallows every fish or animal that it can overcome and introduce into its enormous mouth. It spreads out long tentacula in all directions, and encircles its food like a net. A captive once entangled seldom escapes becoming acquainted with the geography of its capacious throat. And notwithstanding it will gorge itself to repletion when opportunity occurs, it lives four or five months without food. It sometimes swallows one of its own species by accident, and though any other food is at once dissolved into a gelatinous compound by digestion, the fluid secretions of the stomach have no effect upon it, and it passes out entirely uninjured, after remaining confined for twenty hours. Either side of this curious animal is as capable of digesting food as the polype, which may be proved by turning them inside out. They will renew themselves after having undergone every sort of mutilation. If the head is split in two, the cut portions will unite and form two heads, and in a few hours each will have separate mouths and other necessary apparatus; and if split into ten parts, will form ten distinct heads; and if you cut the heads off, others will replace them, and the heads acquire fresh bodies. When the hydra becomes unwieldy he splits himself into two parts, each of which becomes independent, and grows until the animals are formed equal to the former bulk. You may take the tentacula from one and engraft it upon another, by cutting an orifice and thrusting it in, when it immediately unites by joining heads, bodies, and tails together. You may make an artificial monster, such as is rarely seen by man. No imaginable combinations of chemical or mechanical powers bear the least resemblance to this wonderful reproduction, nor can this hopeless enigma be solved; all we can do is to behold the phenomena in silent wonder, and praise nature for showing so much solicitude to secure the multiplication of species, and disseminate them throughout the habitable world.

If the claws of lobsters, fins of fish, heads of snails are cut off, they will be reproduced. I once cut out the eyes of a lizard, and new eyes were formed, as perfect in every respect, as those removed; as I never kill or injure animals, even to aid science, I must be permitted here to state, that the lizard in question, partially lost its eyes through some accident unknown to me, and I cut them to relieve it from apparent pain, not believing in the doctrine that is always best to kill, in order to put a creature out of suffering; had I done so in this instance, I never would have known that eyes could be renewed in a lizard.

I have not been able to discover any eyes in the hydra, still they most assuredly feel the influence of light, which is plainly shown by their locating themselves when confined, in a position where the most light prevails,

still this may be evidence of fine touch, that prompts them to seek warmth which accompanies calorific rays. This creature uses its tentacula as a cable, and moors itself so securely as to defy agitated water, however violent may be the commotion. When attacked it rapidly contracts all its tentacula and body into a ball, and thus escapes notice.

Thus God proceeded step by step, from this senseless hydra to man; each formation being apparently the natural consequence of the preceding one, and each individual form fitted and endowed to perform its part in the great plan of nature. Even the supposed extinct animals, in every instance, exhibit a relationship to those now living. To bring this great work about, what a vast number of calculations must have been made; what an immense number of contingencies provided against; what a tremendous number of circumstances taken in consideration; what myriads of conflicting elements made to harmonize the promotion of the great purpose of the Creator?

THE STICKLEBACK (*Gasterosteus*).

There are several varieties of these fish in our waters, all of them more or less voracious. They sometimes use their spines against each other with fatal effect. They inhabit locations filled with rocks and sea weeds, in which they construct a regular nest, in the month of April, as a receptacle for their spawn. After having deposited it the male and female is invariably found in its vicinity, and woe be to the fish that has the temerity to approach too near, as their ferocity knows no bounds, and they never loose an opportunity of displaying it. Their nests are seven inches long, and shaped like a pear, and are formed by matting together various alvæ; these are tied by a thread which is passed around them in every imaginable direction; it is very long, exceedingly fine, elastic and strong as silk, and supposed to be formed by some albuminous property contained in the fish. Their body is fusiform, containing on the sides about thirty transverse plates, elevated from which there are several sharp spines. The first is placed above the base of the pectoral, the second above the fourth lateral plate, the third near the dorsal fin.

This fish is exceedingly active, lives three years, and devours with a keen appetite, worms, insects, and the ova of nearly all varieties of fish. It is universally infested by intestinal worms. They appear once in eight years in the Welland canal, in such immense shoals, as to be worth only half a cent per bushel, and are used as manure.

There are several varieties of the stickleback; among them may be named the skippang, stickleback (saltatrix) a native of the Carolina sea coast, where it may be frequently observed leaping out of the water. It has eight spines on the back, connected by a thin membraneous substance.

The ten spined stickleback (pungiticus) is about two inches in length, and is found in seas, lakes and rivers; the body at the tail is carinated on both sides, and covered with shields; the back and lateral lines are straight.

The fifteen spined stickleback (spurachia) is seven inches long, slender in form, with a tubular head, frequents shallow shores, and feeds upon small marine insects.

TETRIDONS.

These fish are peculiar from the fact that they are provided with the remarkable means of instantaneously assuming the form of a balloon, by swallowing at one gulp an enormous quantity of air. When the abdominal portion becomes light, the body immediately turns over, and the fish floats upon his back, without possessing the least power of locomotion, but is driven about at the mercy of the waves in a state of perfect security, from the fact that his body is thickly covered with sharp spines, which present a formidable front to enemies on all sides. Its skeleton is exceedingly simple, and indicates no ribs ; where these bones generally exist there are only transverse processes of verterbræ, or continuations, which may be called appendices. There is no sternum to attach them to below, even if they existed, as some writers say they do. Rudiments of this bone may be found in the herring and dory.

This fish is enabled to roll itself on the shore for a considerable distance from the water, showing that a most perfect relation keeps pace with the peculiar circumstances in which different varieties of fish may be placed. Those being weak are studiously protected by a dull integument, covered with spines, strong enough to guard them from the most bold assailant ; while the voracious tribes enjoy powerful muscles to enable them either rapidly to progress towards their prey, or escape their enemies. As a general rule, however, fish move with the greatest rapidity through water, and apparently without effort or fatigue. The salmon travels weeks together at the rate of twenty miles an hour, and sharks cross the Atlantic in company with the fastest merchantmen, receiving maintenance the while from the inexhaustible fund prodigally prepared by harmonious nature, whose minutest drop of water contains four hundred millions of insect life. And yet man, instead of glorifying God, his maker, for these creations of innumerable hosts of creatures, furnished to feed those that gratify his appetite, attributes their organizations to unguided physical agencies, instead of that Almighty Intelligence that planned, executed, and now maintains the whole.

THE ELECTRIC TETRODON, (*Electricus*),

Is brown on the back, sea green below, and yellow on the sides, varied with green, white, and red blotches ; is generally found on rocky bottoms, and when coming in contact with the hand of a person, affects it with a severe electric shock. This creature subsists chiefly on testaceous and crustaceous animals.

Among fourteen others of this family, may be mentioned the oscellated (oscellatus), which is marked with a black crescent over the shoulders, dull

green back, with a dark spot upon it, edged with yellow. It is found in great quantities in the seas of Japan. The flesh is delicious, and though a deadly poison, is eaten, notwithstanding the express commands of the Emperor to the contrary, and the penalty of death in the bargain.

DIDON (*Odous*).

Belongs to a genus of plectognathic fishes, with undivided jaws, each possessing a single and continuous dental plate. Its form is spherical, spines triangular, and body suborbicular, terminating abruptly behind, where it is edged by a narrow fin; the back is brown, and abdomen silvery white. It grows to weigh five hundred pounds, and ten feet in length. Its whereabouts at night may be known by a strong phosphorescent light which it emits. The moment this fish is taken, it inflates itself to an enormous degree, and assumes a grotesque and anomalous appearance, and as it dies, contracts to its usual size. The flesh, though coarse and stringy, is frequently eaten.

THE SHARK (*Squalus*).

Has an abtuse head, and seven spiracles on either side of the neck; half covered oblong eyes, with a capacious mouth, completely armed with needle shaped teeth; many of them are movable, and some fixed, and of sundry forms; the body is long, round, slender, rough, and covered with prickles; the ventral fins are smaller than the pectoral, and placed near the vent.

The shark tribe are all marine, and much more numerous in warm than cold climates. In their habits they are solitary, and always prepared to devour anything that will pass down their throats. Specimens have been known to weigh four thousand five hundred pounds. Some of the family are gregarious, and subsist upon clams, oysters, lobsters, and other marine animals. They are viviparous, and protrude their young in pellucid sacks, such as I suppose the cod, hake and haddock do, with which they encircle sea weeds and other fast matters. The flesh of this fish is hard and stringy, so much so that even young ones are not eatable. When taken into a dark place their bodies emit a strong phosphorescent light. The female breeds several times each year, and produces from fifteen to twenty at a birth. Its liver is very poisonous, and if eaten produces a stupor for many days, during which period the cuticle falls off, and death sometimes ensues. It smells food at a tremendous distance, and fearlessly pursues its prey to the very shore, and is only held in contempt by the natives of Otaheite, who are so dexterous in swimming that they are enabled to avoid the most furious attempts of this voracious monster to catch them.

There are several varieties of sharks, among which may be named the spotted shark (catulus), panther shark (canicula), hammerheaded shark (zygæna), tope (galens), blue shark, (glaucus), basking shark. This creature has a slender body, from twenty to thirty feet in length, lead color above, and white beneath; the upper jaw protrudes over the under, and

the mouth is filled with four thousand small, sharp, conical teeth; it has two ventral, two dorsal, two pectoral, and one extra fin, for which I cannot find use. It can lie on its breast or back at pleasure, and is usually found in the northern seas basking on top of the water in the sun. It is the only shark that fears man, and never betrays a ferocious disposition, but is satisfied to feed on marine plants and medusa. In contradistinction to other sharks, they appear during the summer months in large shoals, generally swimming in pairs, with the upper fins above the surface of the sea. They are taken for the oil in their liver, which, from large individuals, yields seven or eight barrels. When struck with the harpoon the animal remains perfectly inactive, as if recovering from surprise, for several minutes, and then plunges with great violence headlong to the bottom, and rolls on the sand, with the view of ridding himself of the harpoon. Finding his efforts unavailing, he darts off with wonderful rapidity, and draws a boat of sixty tons after him against the wind. In some instances twelve hundred feet of line has been payed out, and twenty hours' time lost by twelve or thirteen men before subduing a large shark of this species. The oil of such a one is worth one hundred and twenty dollars.

THE WHITE SHARK (*Carcharias*)

Is the most remarkable of all his tribe for his tremendous powers of destruction; he frequents all oceans, but is more partial to warm latitudes than cold. It grows until twenty years old, and frequently reaches the length of twenty-nine feet. The mouth is very large and completely filled with sharp, serrated teeth, set in rows, which, by a peculiar apparatus, he can depress or raise at will. His color is a pale brown, lighter below than above. The tail is so powerfully strong, that a young one, seven feet long, is able, by a single stroke, to break the leg of an ox. Entire human bodies, as well as bones, have been found in a specimen of this variety. They are abundant on the coast of South America, particularly in the vicinity of the pearl fisheries, where they often have an opportunity of appropriating to themselves, negroes engaged in that arduous business; many of whom when they dive, are armed with a sharp knife, and as the shark is compelled, owing to the situation of his mouth, to turn on his back before he can seize his prey, they are sometimes enabled by a well directed thrust, to pierce his heart, and thus escape a terrible death. The supply of blood to a shark's heart flows in a continuous stream, producing a dilatation of the receiving cavity, which contracts when it reaches a certain point. The blood is then driven into every part of the arterial system by powerful muscular action. This important object is attained by means of the auricle, which, without the aid of the ventricle, could not act. Important valves may be seen between the ventricle and auricle, revealing in their wonderful construction, an astonishing refinement of mechanism. The arteries composing the main trunk of the aorta, become exceedingly muscular when distended rapidly, and close upon their contents. In this artery even, there are rows of valves, and several in the branches proceeding from it,

which divide and subdivide until the numerous ramifications reach an extreme degree of minuteness, extending themselves to the remotest parts of the body, and they frequently anastomose, by collateral branches to prevent interruptions in the circulation, through hundreds of thousands of capillary vessels, many of which are finer than the hairs of your head. If you would see this extraordinary operation on a small scale, examine with your microscope the transparent membranes of fishes and frogs, observe particularly the capillary arteries, note their unceasing activity, view the transit of fluid streams through the veins, and other complicated operations, too numerous to mention, and your mind will be filled with the highest admiration and astonishment.

BLIND GASTROBRANCHUS (*Myxineglutinosa*)

Has eight beards at the mouth, orange colored teeth, body destitute of scales and fins, except a narrow one near the tail. There extends from head to tail, beneath the body, a double row of pores equi-distant apart. The spiracles are beneath the body, and the shape of the fish something like an eel. They enter the mouths of fish, and after having eaten the entrails, prey upon the flesh and leave nothing but the skeleton. It is so excessively glutinous, that if placed for a couple of hours in a tub of water, it is rendered sufficiently viscid, to enable a person to draw it out in long threads. By the most careful investigation, it has been found impossible to discover even a trace of eyes in this creature.

In the structure of animals, there are but few parts that exhibit the law of gradation more remarkable than the spine in fishes, in which progressional development may readily be traced from the rudimental condition as shown in the gastrobranchus, to the most perfect of the osseous species.

Its pretentions to be considered among the vertebrate, as some have placed it, is to my mind equivocal. The vertebral column is a soft and flexible tube, composed of a cartilaginous substance, exhibiting merely a trace of division into distinct rings, and is not the channel intended for the spinal marrow, as there is a nervous cord outside for this purpose.

THE FISHING FROG.

This singular fish has an attenuated tail and enormous mouth, but no force or means of defence ; is a slow swimmer, and is consequently compelled to procure its subsistence by stratagem. It covers itself with mud, sea weed, &c., and agitates by muscular power the filaments of fringe that cover its body. They appear so much like worms, that fish approach boldly to seize them, when they are swallowed by a single rapid movement of the fishing frog, and pass down his capacious throat with great ease, where they are retained by a multitude of teeth. The stomach of this extraordinary fish, like the Gillaroo trout of Ireland, is endowed with great muscular power, adapting it, like the gizzard of fowls, to perform the two-fold action of digestion and mastication. When they swallow oysters, clams, or other shell fish, they swallow stones likewise, to assist in breaking them up. The common trout has been known to do this likewise.

Many fish live altogether on shell fish, which require great power and muscular strength in the jaws, besides strong grinding teeth, to break them down and triturate them sufficiently to be digested; among these may be named, in addition to those mentioned, the mullet, wolf-fish and sepia.

The mouth of the wolf-fish, (anarchichas lupus,) is completely paved with sharp, strong teeth, having three rows on each side of its jaws, and is capable of exerting immense power in breaking the shells of oysters, clams and other crustaceans. The flavor of this forbidding fish is superior, and if properly cooked, compares favorably with some that are highly esteemed.

The sepia when pursued, immediately renders the water black and turbid, by ejecting a dark fluid, which it secretes in certain glands; this matter was collected by the ancients and used as ink.

Tunc queritur, crassus calamo quod pendeat humor,
Nigra quod infusa vanescat sepia lympha;
Dilutas queritur geminet quod fistula guttas.

Though all the sepia family yield this black pigment, still the sepia officinalis, is principally sought after. It is perfectly insoluble in water, but diffuses rapidly through, and requires a long time to settle down. When prepared with lye, a beautiful brown is the result, and this has given name to the sepic drawing. Its structure is singular, being mainly composed of thin plates of a calcareous nature, connected together by small hollow pillars of the same substance, which do not, however, adhear in any manner to the internal animal, further than to give it support.

The sepia has two large fleshy fins extending along the body, and uses its tentacula for locomotion, which it strikes from behind forward like oars, and moves through the water tail foremost. When on the bottom of the sea they are used as legs, and it walks with its head downwards. The reason is, that the mantle encloses the creature perfectly, except where the head, neck and tentacula protrude; through the same opening the respiratory organs receive water. Two of the tentacula are much longer than the others, and have a thick cylindrical lip at the bottom completely covered with suckers, with which they attach themselves to rocks during storms at sea. The short tentacula are provided with suckers at certain distances apart along their entire length, which are moved by an immense number of nerves, furnished with a multitude of ganglions. The mouths are situated in the center of these, and are surrounded by a membraneous tubular lip, having two mandibles something similar to a parrot; they are crooked, and the upper one slides into the lower one. With these the sepia crushes fish, oysters, &c., which are swallowed in pieces an inch or more square, and are then triturated by a muscular gizzard similar to that found in the turkey. They destroy individuals far larger than themselves, by encircling them so strongly with their tentacula as to deprive them instantaneously of motion, when suffocation ensues. There is no animal better calculated to keep the inhabitants of the ocean within proper limits than this terrible cuttle fish. They have no less than three hearts for the purpose of circulating their blood; the middle one forces the blood through the arteries; it then returns by the vena cava, which, being divided into two canals, drives

it into the two other hearts, each of which in turn expels it, for oxygenation, to the gills; after that process it returns to the center heart.

The sepia has very large eyes, possessing a hemispherical humour of a vitreous nature, located just in front of a concave retina; the crystalline lens is soft exteriorally, but dense within, and possesses a hard nucleus; the iris is distinct, but the eye is devoid of a cornea; the globe is spherical, sclorotica double, and pupil kidney-shaped. The whole eye is very large, fiery, and ferocious looking, and may be distinctly seen in the water, either by day or night. They have a decided dislike for any strong-scented substance, and will flee from it more rapidly than from man.

Its alimentary canal is large and complicated, and whatever is swallowed is finally subjected to an extensive nervous and vascular surface, and various secretions, derived from sundry sources, produce powerful chemical effects upon the aliment, which is propelled forward by a succession of contractions, termed peristallic motion. Its progress along the canal is retarded sufficiently to yield the greatest quantity of nourishment that it can afford.

This creature may be considered one of the most remarkable works of the Creator, revealing to man His goodness, wisdom and power, through the book of nature.

SUCKING FISH (*Remora*).

The tail is forked, and head crossed with from fifteen to eighteen bars; are brown, and eighteen inches long. It has an apparatus on the top of its head, by means of which it adheres firmly to ships, rocks or animals; swims slowly, and with difficulty. This adhesive property induced the ancients to believe that the remora could arrest the progress of any vessel under full sail. Five or six of them have been found fastened to the body of a shark. This fish has never been known to swallow one of them. The Indians of Jamaica and Cuba formerly were accustomed to feed and take care of the remora, for the purpose of catching fish with it. The modus operandi was, to carry them out into the ocean, secured to their canoe by a long strong line. The first fish the remora met, he attached himself to, and when exhausted, both were drawn into the canoe. They caught turtles in this manner, heavier than a man could carry, and on the Mozambique coast they were used expressly for this purpose. Their flesh is dry, hard, and tastes precisely like artichokes fried in oil. When first taken its body swells, as if the fish was enraged, and the eyes, filled with apparent fury, suddenly project in a terrible manner.

LUMP SUCKER (*Lumpus*).

Has an angulated, bony, tubercled body, a thick shape, sharp and elevated back, rough skin, destitute of spines, and swims edgewise. The clappers are beneath the pectoral fins, in an oval aperture surrounded by a muscular fleshy substance, by means of which it adheres with immense strength to anything it feels inclined to. The abdomen is of a very bright crimson color, inhabits the Arctic, Atlantic and Indian oceans, and deposits a beautiful lemon-colored egg, on the shore, in May.

The flesh is tough and insipid, and is usually boiled with the liver and roes. It is an oily fish, and forms the principal food of seals on the northern coast, they appear to prefer it before any other food, and are often taken when eating lump suckers, which causes the water above to present a smooth appearance owing to the oil. There are several species of them. The snail sucker *Liparis*); small sucker (*Minutus*); bimalculated sucker (*Bimalculatus*); dentex, lineatus, ventricosus, bispiosus, &c. They are all less than twenty inches in length.

SWORD FISH (*Gladius*).

The head and upper jaw has, at its termination, a sword; the mouth is smooth and without teeth; the body is scaleless and round, and the gill membrane eight rayed. It often measures twenty-two feet in length, is active, cruel, and voracious; it pierces and destroys any fish smaller than itself that comes in its way; having a capacious mouth they are readily swallowed whole and digested at leisure. Its flesh is nutritious when salted; the portions taken from the vicinity of the tail are most esteemed. In Sicily the fins are salted and sold under the name of callo, and are there considered a luxury. When depositing ova, they always appear in pairs, and rarely go into fresh water rivers, as has been erroneously stated. They are, in every sense of the word, salt water fish, and cannot exist, even for a short period of time, in fresh water. They are caught thus: A person ascends the cliffs that hang over the sea and watches until he spies one, when he gives notice, by signal, to the boat below, and indicates the course the fish is taking. The boatmen then ascends the mast, and if he sees him, directs the rowers; when near enough, he descends and spears him. In the Arctic seas, the sword fish frequently attacks whales, and is invariably the conqueror, though he sometimes drives his sword too deep, and is unable to withdraw it, when both die. I saw a plank of an East Indiaman, in the British museum, that had been pierced by a sword fish, in such a manner that the sword passed through, almost to the jaw, and remained perfectly imbedded, how tremendous must have been the strength of this fish, to have enabled him to perform such a wonderful feat. When young their flesh is well flavored, digestible, and much esteemed.

CHÆTODON (*Chætodon*).

Has retractile lips, narrow mouth, small head, numerous moveable teeth, minute eyes, furnished with a nichtating membrane, a deep compressed body, ornamented with variegated transverse bands, covered with strong denticulated scales. The anal and dorsal fins are long and broad. There are sixty species of these fish that have been distinctly ascertained, and perhaps more to become acquainted with.

The beaked Chætodon may be considered as the most remarkable; it has nine spines in the dorsal fin, with a spot on the sides, an entire tail, and cylindrical beak; is generally about eight inches in length, with a dark back, marked with transverse brown bands with white edges and a white

abdomen. It feeds chiefly on flies and marine winged insects. When its attention is directed towards one on any of the neighboring aquatic plants, it approaches deliberately, and with the greatest caution, until it reaches a point directly under the object of attack. Then observing an oblique position of body, and placing its mouth just below the surface of the sea, darts a drop of water from its tube like snout, even to the distance of six feet, directly upon the object, which it scarcely ever fails to bring to the surface. If there should chance to be several insects near each other, the fish spouts successively, without moving its position, a drop upon each, and then devours them at its leisure.

THE ANGEL CHÆTODON (*Catesbeii*).

Is very common off the coast of South Carolina. Its color is a beautiful green; the ventral and pectoral fins, as well as the tail, are orange colored; the anal and dorsal fins blue at the base, and crimson at the tips. It is much esteemed by the *natives* for its flavor, which is delicate and superior to the salmon.

THREE COLORED CHÆTODON (*Tricolor*).

Is jet black behind, with the exception of the tail, which is a brilliant yellow and red at the end; the fore part is of a golden yellow hue; the gill covers and fins are red.

RED STRIPED CHÆTODON (*Setifer*).

Has a round spot and bristle on the dorsal fins, and is variegated by longitudinal blood red bands on the body, which is covered with strong scales. All the fish belonging to this family are very remarkable for the brilliancy of their colors, singularity of their forms, and quickness of their actions. Its principal food being flies, it may with propriety be called a fly shooter.

OYSTER (*Crustacea*).

May be found distributed near the coast in nearly all latitudes, abounding particularly in France, Britain and America, forming in those countries an important article of diet. There are many species, but those belonging to the ostrea edulis of Linnæus are the best.

Their nervous system appears to be limited almost entirely to the faculties of touch and sense, as no organs of sight have yet been discovered. Every oyster is no doubt completely perfect in itself, and individually capable of reproducing its kind.

In May, June and July the ovary is filled with a whitish fluid, which, under the influence of the microscope, is found to be ova. In July extrudation takes place, and the spawn attaches to rocks, stones, reeds, and frequently to other shells, and in less than a day after are covered with a shell.

They have an organ called a foot, composed of layers of fibres, which, by contraction and expansion, bestow on it the power of locomotion in a small degree. They close and open their shell by contracting or expanding the abductor muscle, which is attached to the interior opposite sides of

the shell. When it is contracted, the shells immediately close, and when relaxed, open. The moment this muscle loses its power, the oyster dies. I have made two artificial beds of them in the Hudson river, and one in my pond, and will be able next year to report progress. When it is desirable to propagate oysters, the stones and cultch having them attached are removed to the selected location and planted. In eighteen months thereafter they are fit for market, but are not really in perfection for the table until three years old.

I noticed, when on the coast of Baia, near Naples, and in the lake Tacino, an immense number of reeds, so arranged as to form circles, just showing their ends above the surface of the water, and on inquiry, was informed that they were covered with oysters. When required for use the reeds were raised, one after the other, and those having attained the proper size removed, when the reeds were again replaced. In these waters oysters attain full size at two years old, but I did not consider them comparable to our East river oysters, which, to my mind, are superior to all others, not even excepting those taken from the beds of Milton, forty miles from London, which have a world-wide reputation. Oysters in Brittany, from the beds of Caucalle, have been famous for many years, as well as those taken at Dieppe ; but I always fancied I was eating copper when partaking of them, as they have precisely the flavor that copper would have in your mouth ; still I soon became fond of them, particularly in a raw state, which I think is the preferable way of eating them, as they lose by cooking their mucilaginous nutritive albuminous matter. As food, they are, when fresh, highly nutritious, and constitute a very light diet. Oysters, when fattened in artificial beds, assume a green tinge, by feeding on a minute plant known as confervæ, that grow in great abundance in all shallow waters where the sun has much power. This has led to the popular error that the color is occasioned in consequence of copper in the rocks, no trace of which has ever been detected by chemical tests. There is no truth in the idea that all oysters possess aphrodisiac properties.

Like other fish, they are never in season at the spawning period, which covers half of May, July, and part of August, when they are sick, unwholesome, and liable to engender diseases among those who eat them. During the oyster season, the consumption among all classes is enormous ; they may be kept for a number of days in salt water, and in fine condition, by the addition of small quantities of oat meal occasionally, of which they are very fond.

The annual report of the Baltimore American, states that in 1858, the oyster business fully equalled the Maryland tobacco crop in value, and that it is constantly increasing, without any prospect of a diminution in the demand, and that the more the beds in the rivers are "fished," the more rapidly they appear to increase. The most experienced oystermen declare that they are far more abundant at the present time, than they were some years since, when the demand for them was much less. The value of packed

oysters in Baltimore, is acknowledged by the report to be ...	$3,000,000
And those consumed in the neighborhood,.....	1,000,000
Shells converted into lime for agricultural purposes,.....	50,000
Total,.....	$4,050,000

They obtain all their oysters south of the mouth of the Patapsco river, a great portion by dredging in twenty fathoms of water; these, however, are not so large as those taken with tongs in the numerous shallow inlets and bays, and near the mouth of the Chesapeake.

When planting, they take small oysters from deep water, and plant them in shallow places, where, in three years, they grow to a very large size, without being in the least affected by any weather, consequently the increase is unfailing. The number of vessels engaged in this trade last year amounted to one thousand, some of which cost three thousand dollars, and are capable of carrying three thousand oysters. The number of houses engaged in the business is twenty-five; the number of hands employed in opening and packing, is two thousand five hundred, and of these, one thousand six hundred are negroes, who are wonderfully skilled in the operation. In some establishments, three thousand bushels are opened in a day, and in all the establishments, seventeen thousand bushels daily; of this quantity, nine thousand bushels are packed in cans in a raw state, and the rest are pickled, spiced, and hermetically sealed for exportation everywhere. The price of oysters in the shell from the boats, varies from thirty-five to seventy-five cents per bushel, and averages forty-five cents. The cost of solder and tin is about two hundred and fifty thousand dollars annually. The number of tinmen required to work it into cans, is three hundred. And one million feet of boards is used in manufacturing boxes to pack the cans in, to construct which, employs two hundred carpenters. Exclusive of the value of buildings and vessels, the capital invested is a million of dollars, and the sales amount to three millions of dollars. About half of the packed oysters are consumed in our western cities, and are sold invariably for cash. Within twelve years, the business has increased ten fold, which may be attributed to the facilities of transportation. They ship raw oysters from Baltimore to South America, California and Australia, besides all parts of Europe, and the demand will steadily increase as they become better known, from the fact that Chesapeake oysters, like canvass back ducks, owe their superior flavor to the food obtained on their feeding grounds.*

LOBSTER (*Cancer gammarus*)

Are found on all the rocky coasts of northern seas, and in vast quantities where the water is of sufficient depth to suit their habits.

They are usually taken in traps formed of small branches and twigs, which, after being baited with garbage, are lowered into the sea, and their location marked by a floating cork.

*As I have not tried any experiments with the clam, scallop, muscle or cockle, I will not attempt to describe their history or habits.

They are amazingly prolific, thirteen thousand ova having been counted under the tail of a single female, and three times that number within; the eggs are deposited in secluded, sandy spots among the rocks, where they are hatched in thirty days.

They change their shells every year, during which period they are sick, languid and perfectly helpless, becoming an easy prey to their fellow lobsters, by whom they are devoured with great gusto. At first the shell is membraneous, but it soon hardens; during the process, the animal grows rapidly.

It is singular that a lobster has the power, if seized, of throwing off the great claw, or any other membrane of its body, except the tail, and still more so, that in three weeks the member will be reproduced. In shallow water they run very rapidly upon their small claws, and if in eminent danger of being taken, spring tail foremost at least twenty-five feet with as much agility as a bird could fly the same distance.

They have an insatiable appetite, and will eat all sorts of dead fish, carrion and even sea weed.

ROBERT L. PELL.

NEW YORK STATE AGRICULTURAL COLLEGE FARM.

ITS CHARACTERISTICS AS INDICATED BY ITS GENERAL BOTANY.

(By Professor William H. Brewer.)

That the plants found growing, without cultivation, or that are easily cultivated on a soil, indicate its characters as regards its fertility and adaptation to cultivation, is a fact that no one will deny. The emigrant, prospecting a new country with a view to settle, carefully observes the *timber* growing on it, not more for the value of the timber itself than for the indication it gives of the character of the soil; or if the land be prairie, without timber, he observes what kind of grasses or weeds grow, knowing that, in either case, the natural vegetation is an unerring index of the capabilities of the soil for farming purposes.

These are but the larger or more conspicuous vegetable productions, but persons of even no technical or scientific botanical knowledge know, that many of the more inconspicuous plants are no less sure indices of the same thing. Marl beds are found where certain weeds grow, a retentive subsoil is indicated by others; in fact the weeds, grasses, herbs, and very mosses tell if the soil is light or heavy, wet or dry, warm or cold, fertile or barren, and they also tell something of its chemical composition, if it contain much or little lime, clay, sand, potash, or vegetable matter.

These general facts have been noticed from the remotest ages, but the science of botany, in these later times, has done much to advance our knowledge in this direction, and the mere scientific man may often possess a knowledge of many facts of great value to the practical farmer, for the latter generally knows or recognizes but a comparatively small portion of the whole number of plants that grow in one locality; even if he be a close observer, he is acquainted with comparatively few species. He may know the prevailing kinds of timber, and the more common bushes and shrubs, the common cultivated grains, grasses, fruits and vegetables, the most common weeds; and these, with a few medicinal herbs and ornamental plants, constitute the whole that he knows by sight, and in most localities this number is quite small.

It is rare that a farmer knows more than seventy or eighty different species, oftener not fifty, while upon his farm at least three times that number, and, indeed, more probably, five times that number grows.

I use the word *plant* here in its widest sense, as botanists use the word, as meaning all those living things which are not animals, that is: all trees, timber, bushes and shrubs, all grasses, grains, weeds, herbs, vegetables, fruits, &c.

Plants grow in nearly all situations on the earth's surface where there is a soil and moisture which are not perpetually frozen, but they vary so with the variations of soil, climate and other physical conditions, that each land and clime has a vegetation adapted to its conditions, and has some plants especially its own, that is, some that are found only in that land or clime. We never seek palms in the polar region nor firs on the tropical islands; hence, if we enumerate all the plants found on the earth's surface the number is enormously large. But in any one country only a very small part of the whole number is found, and in any one locality in a temperate climate, the number is so comparatively small, that any one of the most ordinary capacity can learn to recognize them; but as only a small part of even this number belong to the commonly called useful plants, or noxious weeds, they are passed by unnoticed and neglected. Those which are so frequent as to become familiar, or those of direct use or harm are known; the others not, although the latter, equally with the former, are indicators of the soil and climate. To illustrate: that most important family of plants, the *grasses*, to which belong not only our grasses proper, but all our most useful grains, a family of more use to man, perhaps, than any other, and species of which are found in every land and clime; this family numbers some 4,000 species; that is, about that number is known to botanists; and a very singular family of plants, the *sedges*, is so nearly like the true grasses that the two are confounded by the ordinary observer, number some 2,000 species more. These two number at least 6,000 species, yet not over 300 at most are of any considerable practical use, and not half of that number are cultivated—not over one-thirtieth of the whole number, not three in a hundred—while to the "practical" man the remainder are unknown, although they, equally with the few cultivated ones, have their preferences as to soil and climate, and, indeed, are generally more sure indicators of these causes than the cultivated ones. The same thing may be illustrated by the plants in any one locality. The "Natural History of the State of New York" describes about 1,450 species of (flowering) plants, which, with a few discoveries since, may make the number found in the State about 1,500, and in any one locality, as in any one county, over one half of this number may be found; yet, as before said, more than four-fifths are of no especial direct use. So they are unknown to the farmer, although they, equally with the plants he sees, or, in cases even more so, indicate the nature of the soil they grow on. But the botanist seeks them out, looks for them in by and neglected places, searches every nook and corner, examines alike the barren and fertile field, the dry sand and stagnant swamp, the waste ravines and neglected hedge rows, and these unnoticed species are generally more sure indices of the characters of the soil than are the more commonly observed weeds and plants, for many only grow under certain peculiar conditions, even more exact than the common larger timbers, and no more certainly do the oak or chestnut prefer certain kinds of soil than do these.

Again, the *kind* of species not only indicates the kind of soil, but also

the *number* of species indicates to a certain extent, the *variety of soil.* Within certain limits, like soils (I mean in the same vicinity, or country,) produce like plants, and unlike soils, unlike plants; that is, the greater the variety of soil, other things being equal, the greater will be the number of species found. A farm on a western prairie, where the soll is all alike, and the whole farm has the same exposure, although it may show a great luxuriance in its growth of vegetation, yet the *number of species* will be much smaller than on many farms of much smaller size, which have a greater variety of soil.

All persons will concede that if an agricultural college has attached to it a farm, either for purposes of experiment, illustration or means of employment to students, it is of the highest importance that it should possess the greatest variety of soil possible. The trustees of the New York Agricultural College felt the importance, I might say *vital* importance of this matter, and only made the selection they did after much deliberation. Had they selected a farm having no variety of soil, however fertile it might have been, or how complete all its other qualifications were, the general feeling would be that it was unfit for its purpose, or at least ill-adapted to it. The object of this paper is to throw some light on the character of the farm, by a consideration of some of the general features of its botany, or of the plants found growing, without cultivation, upon it.

The writer enjoyed the means of observing this pretty accurately, and although the observations were not made with any view of the use made of them now, (save those of a part of the last year,) still they are none the less accurate, and as far as they go are of value. Of course the work is still incomplete; only years of further observation and study can complete that which is here begun. The observations extend over a period of six successive years, four of which he spent in person on the spot, and his scientific friend and colleague, Prof. J. W. Chickering, Jr., occupied the same ground three years, two of which were an interval between two periods of the four years before named. As teachers of botany, we explored the whole region of the vicinity most carefully, and no other part received so close attention as did that which now comprises the college farm, not so much because of its immediate proximity to the institution where we were employed, as because of its peculiarly rich vegetation. On this farm were each year to be found the earliest powers of spring, and the latest of autumn, and the greatest variety as regards the number of species. In fact, of the whole number of species found growing native in the two adjoining towns, (Ovid and Romulus), which extend from the Seneca to the Cayuga lakes, more than two-thirds may be found on this farm, and the flora of the region is considered a rich one. During the summer of 1858, several thousand specimens were collected, not only for our own herbariums, but for foreign botanists who have expressed desires for plants of this region; and these specimens thus collected furnish the materials for a more complete paper than can be given at this time. An enumeration of the species, details of their location, and the general climate of the region will be given soon in

another paper. I propose in this place only to glance at main features for even an enumeration of the species observed, without other details, would swell this article beyond its proposed limits.

The farm is about two and a half miles long, and extends east from the shore of Seneca lake, the eastern end lying on the ridge between the lakes, and has an elevation of about 550 feet greater than the western, the slope being gradual, and the exposure to the west. A small stream, having its sources mostly beyond the farm, runs through it to the lake. It is bordered in some places by dry grain land; in others by a narrow swale; while nearer the lake it sinks into a deep rocky ravine. The immediate banks of the Seneca lake form low bluffs, from the top of which the land rises gradually to the extreme eastern end of the farm at Ovid village.

The rock underlying the soil at the western end of the farm, and which crops out at the lake shore and in the ravine, is a soft shale, the "*Moscow shales*, (of Prof. Hall, in his reports on the Geology of New York), belonging to the upper part of the *Hamilton group*." On this lies the "*Tully limestone*," an impure limestone, having a thickness on the farm of about eleven feet, half of which is sufficiently compact for building purposes, and is pure enough to be burned for lime, as is done in the immediate vicinity.

Above this lies the "*Genesee slate*," which underlies the upper part of the farm, or at least two-thirds of the land. This last is a slaty sandstone, very variable in both its chemical and physical characters, varying from shale and slate to slaty sandstone, and even compact sandstone, thin strata of which are compact enough for building purposes, and indeed on the extreme upper part of the farm it has been obtained for this use.

The rock in places has each of these characters, and varies by all possible mixtures and proportions of these; hence by its decomposition forms some of the most fertile lands of the State. No better proof of this is needed than the fact that a large part of what is known as the "*Genesee country*," of central and western New York, a region of world-wide renown for its fertility, lies on this same geological formation, having precisely the same physical and chemical character.

These varied characters of the underlying rocks, combined with other causes, give great diversity to the soil. There are consequently on the farm, very dry soil, rather wet soil, thin soil, lying near the rock, deep and rich soil, soil poor in organic matter, and soil black with organic matter, sandy loam, clay loam, stiff clay, brick clay, hard gravel, &c., the details of which can only be made intelligible by a map.

In regard to the natural vegetation of this farm, the purely scientific botanist would class it in five divisions, that is, plants betokening five very different conditions, in each of which, some plants would be found, not found in the other four; but this classification would be entirely different from that which a practical farmer, unacquainted with botany, would form. The former would class it as follows:

1. The open, tillable fields, and their margins.
2. The margins of brooks and swails in the cleared fields.
3. The forest and copses.
4. The rocky ravines.
5. The bank and shore of the Seneca lake.

The latter would, in his classification, divide the first into several subdivisions; would consider the third only in respect to its *timber*, and would neglect entirely the second, fourth and fifth.

It will better answer our purpose at the present time, to follow the classification given.

The earliest vegetation of spring in the whole vicinity, as indicated by the blooming of plants, is at the lake shore, and in the mouths of the ravines; next follows the more sunny slopes, while the upper and more exposed fields are later; the difference between the extremes, amounting in the spring to some ten or twelve days, and during the summer, as indicated by the ripening of grain and fruits, there is a difference of five days or a week, the order being the same; the higher lands, of course, being the latest. The precise dates of the flowering of various species, as observed by Prof. Chickering and myself, will be given in the future article. I will merely state here, in respect to the climate, that while the *mean temperature* and the *annual amount of rain that falls*, is about that of central New York generally, that the proximity of the lakes, and of Seneca especially, which never freezes over, and the exposure to the winds passing it, modify its changes, and render it less liable to suffer from late frosts of of spring, or early frosts of autumn, than many other places, in the state of the same general temperature, but with different exposures.

1. The vegetation of the cleared fields, varies of course much in different parts of the farm, but there may be found several native grasses, and many of the cultivated grasses have become naturalized, and the ordinary herbs and weeds found in the fields of Seneca county, are found here; of the noxious weeds, the Canada thistle is the most troublesome, but is not as abundant as on many neighboring farms.

Next in order, as regards troublesome frequency, is pigeon weed, (red root, stone seed, oil seed, stein kraut, (*lithospermum arvense*,) and this is now less troublesome than formerly. These two weeds are the only ones that are abundant enough to be considered serious nuisances, while many others that are equally serious on other farms, or in other sections, although they may be found, are not abundant enough to be troublesome. Among such may be enumerated buttercups, (*ranunculus*,) two or three species, but nowhere abundant enough to be of any account whatever; wild mustard, (*sinapis arvensis*,) which is a great pest in some parts of the county, is not abundant or troublesome; hedge mustard, (*sisymbrium officinale*,) is still more rare; Shepherd's purse, (*capsella*,) Fletcher weed or Scavish, (*barbarea vulgaris*,) which is abundant in the county, south, is occasionally found along the brook; St. Johnswort, (*hypericum perforatum*,) is not common; several species of chickweed, (*stellaria* and *cerastium*,) are found

but are not troublesome; cockle (*lychnis githago*), sheep sorrel (*oxalis*), and horse sorrel (*rumex acetosella*), are not abundant; mallows (*malva*), not common; five-finger-leaf or cinquefoil (*potentilla*); wild strawberry (*fragaria,*) near the lake; not a single species of hard-hack (*spirea*), those enemies of the scythe in the eastern counties, is found on the farm; wild parsnip (*pastinica*), near old gardens; two or three species of fleabane (*erigeron*), one of which is quite common on the upper part of the farm; white daisy (*leucanthemum vulgare,*) is only occasionally found, that is, is not abundant; camomile (*anthemis arvensis,*) is abundant enough in some parts of the town to be considered a nuisance, but is not common on the farm; May-weed (*maruta,*) is found by the road side; clot-weed (*xanthium,*) is occasionally found near the lake but is quite rare; *rag-weed* or hog-weed (*ambrosia,*) is common on the upper part, as throughout the county, but is not considered of any account; pasture thistle (*cirsium lanceolatum*), in neglected places; burdock (*lappa*), about old door yards but not in the fields; dandelions (*taraxacum*), lobelia, common plantain (*plantago*), and occasionally a specimen of narrow leaved plantain (*p. lanceolata*); common mullein in waste places (*verbascum*); snap dragon or toad-flax, known also as stink-weed, and butter and eggs (*linaria vulgaris*), one of the greatest pests in some parts of the State, is not found in any field of the farm, but grows in an old door-yard, where it has been introduced, and has not spread; dog-bane (*apocynum*), milk weed of several kinds (*asclepias*); amaranth (*amaranthus*), two species or more are among occasional herbs; pig-weed or goosefoot (*chenopodium*), about old gardens; yellow dock (*rumex crispus,*) is found, but is not abundant; but one single specimen of wild onion or leek has been observed on the farm; crab grass (*digitaria*) is sometimes found near gardens but is nowhere abundant; bitch grass or couch grass (*Triticum caninum,*) is found but is not common; quack grass (*T. repens,*) is a pest in the county and is found in the neighborhood, and possibly specimens may be found on the farm, but I have not observed a single one. Many of the common herbs are also found, as catnip, elecampane, yarrow, primroses, &c., &c., but the enumeration has already been carried far enough for our present purpose.

Grass flourishes well, clover particularly so. Wheat, barley and oats grow better than corn. The large amount of lime and clay in the soil peculiarly adapts it to wheat and clover.

2d. Along the brooks and in the swales, localities occupying but a very small proportion of the farm, many species of interest to the botanist occur, but fewer that will answer our purpose to enumerate here. The existence of marl in one or two places, and also in the immediate vicinity, brings in a few plants peculiar to such situations. These localities, although carefully explored through the summer, and which rewarded us with many species for our herbariums, will be passed at present for the reasons named.

3d. The forests are of vastly more interest to the practical man, and will therefore receive more special attention. These, aside from being in-

dices of the nature of the soil, are the pride of the farm, and no finer collection of oak timber, especially white oak, can be found in the town. White oak is indeed the prevailing timber, and many of the trees are of venerable size and age. Some were recently felled, which I observed by counting the annual rings, were over 300 years old, and many that are now standing I judge from the size are still older. The finest timber on the farm is in a forest that occupies the center, but a strip skirts the ravine entirely to the lake, and this, with the central forest, and a small copse of second growth at the extreme western end of the farm, furnish specimens of a great number of species. An enumeration may be of interest:

White oak, (*Quercus alba*,) common and fine; red oak, (*Q. rubra*,) common, and some very large trees; black oak, (*Q. tinctoria*,) less abundant; rather rare; rock oak, (*Q. montana*,) very rare, only on bank of lake. Bass wood, (*Tilia Americana*,) common, but not abundant. Cucumber, (*Magnolia acuminata*,) rare. White wood or tulip tree, (*Liriodendron tulipifera*,) not rare. Sugar maple, (*Acer saccharium*,) common; red maple, (*A. rubrum*,) common; striped maple, (*A. Pennsylvanicum*,) rare. Beech, (*Fagus sylvatica*,) common, but not abundant. Shag bark hickory, (*Carya alba*,) common; mokernut hickory, (*C. porcina*,) common; bitternut hickory, (*C. amara*,) not common. Sycamore, (*Plantanus occidentalis*,) in ravine. White elm, (*Ulmus Americana*,) common; slippery or red elm, (*U. fulna*,) rare; cork elm, (*U. racemora*,) very rare. White ash, (*Fraxinus Americana*,) abundant; black ash, (*F. sambucifolia*,) less common in ravine. Butternut, (*Juglans cinerea*,) not abundant. Black walnut, (*J. nigra*,) in the ravine more common; some very large trees. Wild cherry, (*Cerasus serotina*,) occasional trees. Hop hornbeam or lion wood, (*Ostrya Virginica*,) common. Water beech or hornbeam, (*Carpinus Americana*,) common by brook. Sweet birch, (*Betula lenta*,) in ravine; rare; red birch, (*B. nigra*,) with last, but more common. White poplar, (*Popolas tremuloides*,) common on banks of lake; black poplar, (*P. bolsamifera*,) less common. Red mulberry, (*Morus rubra*,) possibly introduced, but now wild. White pine, (*Pinus strobus*,) rare, only along ravine and by lake; yellow pine, (*P. rigida*,) more common by the lake. Hemlock, (*Abies canadensis*,) not abundant; in ravine. Red cedar, (*Juniperas Virginiana*,) in ravine.

To these may be added some trees of smaller habit, yet trees rather than shrubs, as sassafras, (*S. officinale*,) common. Shad berry, (*Amelanchier canadensis*,) common. Stag horn sumac, (*Rhus typhina*,) common. Dog wood, (*Cornus florida*,) common. Wild plum, (*Prunus Americana*,) rare. White thorn, (*Crataegus coccinea*,) common; common thorn, (*C. punctata*,) common. Willows, (several species not yet determined.) Wild apple, (*Pyrus coronaria*,) but one tree seen.

This list, large as it is, will doubtless be enlarged a considerable on closer investigation. Among the trees found in the vicinity, and *most probably* on the farm also, are swamp white oak (*Q. bicolor*), choke cherry (*C. Virginiana*), scarlet oak, other species of ash, two species of poplar, one

or two of thorn, &c.; yet the list as it stands numbers as many kinds of trees as are found native in the whole empire of France, and more than three-fourths as many as are found in the whole of central Europe, from the North sea to the Mediterranean, and from France to Russia!

The list of shrubs is even larger, many of which are almost large enough to be called trees. I will not give in this place a complete enumeration, but a partial one. Among them may be found several species of willow; one species of birch; white elder (*Sambucus canadensis*). Red elder, (*S. niger*). Smooth sumac (*Rhus glabra*). Poison ivy (*R. toxicodendron*). Sweet sumac (*R. aromatica*), on banks of lake. Wild grapes, two species (*Vitis labrusca* and *V. cordifolia*). Mountain maple bush (*Acer spicatum*), in ravine. Staff tree (*Celastrus scandens*). Jersey tea (*Ceanothus Americanus*). Wild roses, several species. High blackberry (*Rubus villosus*). Raspberry (*R. occidentalis*). Thimble berry (*R. odoratus*). Wild gooseberries, two or more species. Wild currants (*Ribes*), perhaps two species. Witch hazel (*Hamamelis Virginiana*). Honeysuckle, several species. Viburnums, several species. Dog wood (*Cornus*), several species. Whortleberries or huckleberries, several species. Wood pink or May apple (*Azolla*), one species. Labrador tea (*Ledum latifolium*), very rare. Spice bush (*Laurus benzoin*). (*Shepherdia canadensis*), on lake banks. Dwarf yew (*Taxus canadensis*).

This list might be much extended, but enough have been enumerated to illustrate, for over seventy enumerated species (the actual number approaches nearer a hundred,) of woody plants, trees and shrubs, certainly illustrate the capabilities of the soil, if such facts are reliable indices, as they are generally supposed to be. The several cultivated and naturalized trees and shrubs are not enumerated. Fruits, both the larger and smaller, as peaches, cherries, apples, currants, gooseberries, &c., thrive well on the farm, as might be inferred. Many farmers and other practical men of the vicinity think portions of the farm particularly well adapted to fruit and nursery culture, which opinion seems very strongly justified by the very large number of woody plants found native. Some of these species are quite rarities, even with botanists, but the words "common," "rare," &c., are used in a popular rather than a technical sense.

4th. The ravines present less vegetation of direct interest to the farmer, yet it is of importance; many of the trees and shrubs enumerated are only found there, and many species of great interest to the botanist, are not found elsewhere on the farm. Some of these are of interest medicinally, others for beauty, others for showing the chemical composition of the rocks, but the most possess only a botanical importance, hence, they will not in this place be enumerated. The large ravine near the lake, possesses a rare and rich vegetation, and was a favorite field for botanical rambles, and never failed to furnish some species in flower, from early spring to late autumn.

It strikes me that portions of this ravine may be well adapted to growing vines, shrubs or fruits that would require protection of some kind from

the cold winds of winter and spring, or such as prefer sunny slopes for ripening or perfecting. Should the grape culture ever become an important item, thousands of vines could here find the very best possible exposure, precisely such as is preferred in northern France, or the Rhine region in Germany, in fact, of many of the most famous wine growing regions of central Europe, where hand labor is employed. I have often looked on this bank and thought of this use to which it seemed so well adapted. That the soil is naturally propitious is indicated by the abundance of wild grape vines, in fact, the very species (*Vitis Labrusca, L*) from which the Isabella and several other most popular varieties originally were derived. Some of these vines are of large size, and one native vine on another farm in the neighborhood on similar soil, is of the most enormous size I have ever seen the grape attain. At the distance of four or five feet from the root it is thirty two inches in circumference; it here divides into several branches, the largest of which has a circumference of twenty-three inches! The vine mounts to the top of large trees. I doubt if the State produces many larger vines than this.

5th. The fifth division, the lake bank and shore is of small extent, and of still less practical interest, but perhaps of even more interest to the botanist, for here are found quite a number of rare species. A low bluff rises from the shore, the tillable land coming to its very brink, but the strip of but few rods in the widest part, between the fields and the water's edge produces many species of peculiar botanical interest, and not a few that indicate in some degree the chemical nature of the disintegrating rocks, or the washings of the fields above.

I have endeavored in this article to name such plants as are most familiar, to illustrate the subject generally, but hope, as before stated, as early as the next year, to give an actual catalogue of the plants, arranged according to their botanical classification, for the benefit of those who wish more exact data, and in the mean time I hope to place in the collections of the society, as full a suite of the specimens as is practicable.

FENCES.

The annexed article on the building of fences, gates, &c., by S. Edwards Todd, gives in a plain, intelligible manner the varions kinds of fences in use, the manner of preparing the materials, and doing the work of the same. The Executive committee believed that an article of this kind would be useful to our farmers, especially those just entering upon their work. Illustrations as to the most important parts of the work are given. It is not expected that all of Mr. Todd's views will meet with the approval of every one who may read the work, but it is believed it will be found so full in all its details that none will be at a loss how to perform the work described by Mr. Todd, in an economical manner. While fences continue, it is very desirable that they should be properly arranged, and it is believed that this work will accomplish that end. J.

A TREATISE ON FENCING.

By S. Edwards Todd, *Lake Ridge, Tompkins county, N. Y.*

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1. If there is any one thing more than another which is a source of constant anxiety, and unremitting care, to the farmer, it is the erection of suitable fences for enclosing his own grounds, for the purpose of excluding lawless intruders, or keeping his own animals within proper bounds. Wherever a farm may be located, or whatever may be its productions, *fence, fence, fence*, is the first, the intermediate, and the last consideration in the whole routine of the operations of the farm. Erecting new fences and repairing old ones, and laying up a rail here, and fastening a loose board there, is something that demands the vigilance of the farmer, from the commencement to the close of the year. If there is a day, or a number of days, when the laborers of the farm have arrived at a point when they do not seem to know what to do to advantage and profit, they can, almost always find something connected with the enclosures of the farm, the performance of which will be a work of some profit and economy, and sometimes of very great convenience. In the winter and spring, in summer and in autumn, on stormy days and leisure days, and parts of days, if all the plans of the farm are wisely laid, something may be done at fences, or gates, or bar posts and bars. But few farmers have any proper ideas of the expenses attending the fencing of a farm of one or two hundred acres, when performed in an efficient and workmanlike manner; and could they see, at a glance, in dollars and cents, the amount expended in their fences, they would be disappointed beyond measure. As a general rule, so changeable and perishable are the materials of which fences are built, that the

expense of keeping them in good repair, from year to year, consumes a much greater amount of the income of the farm than we feel willing to appropriate for that purpose. But fences must be erected at all events, and anything that will reflect light on the subject of fencing the farms of America, in the most systematic and permanent manner, will be welcomed by every one who is experimentally acquainted with the enormous expenses which attend enclosing the fields of a farm, before it would be prudent to commence the cultivation of the soil.

2. Fencing is a branch of labor, in the operation of the farm, which requires the exercise of a good deal of wisdom and judgment in selecting, preparing, arranging, and disposing of the materials which are to be made use of in building fences, in the most economical, workmanlike, substantial and durable manner; and, as economy, durability, and substantialness, are the most important considerations, as a general rule, in building a fence of any kind, and as there is a variety of materials to be worked up into fences, the preparation of material demands our first attention. It cannot be denied that there is a vast destitution of economy not only in preparing the materials for fencing, but in working up those materials. The very best of materials when improperly prepared, fail to make an economical and substantial fence; and also, the best of fencing materials, when unskillfully arranged and worked up, make a fence far inferior, in almost every respect, to a fence made of materials of a very inferior quality which has been well made. As economy in preparing timber for fencing is an object of the first importance, when the materials are of wood, we shall speak of the best and most suitable time for cutting timber, in order to secure its greatest durability, when it is to be split into rails as well as when it is to be split into posts and stakes.

THE BEST TIME TO CUT TIMBER.

3. Late autumn is the best time for felling timber for almost any purpose, and it is particularly so when timber is to be worked up into rails or stakes, or posts for fencing. At that season of the year the new wood has arrived at its most complete maturity, and there is less sap and albumen in timber then than there is at any other seasons of the year, which albumen, when exposed to the influence of the weather, hastens the decay of timber. If timber be cut, and split out in the latter part of autumn, the seasoning process is much more gradual and perfect, because the grain of the timber contracts more equally and uniformly, rendering the timber firmer, and less porous, and less cracked and checked, than when it is cut at many other seasons of the year. Besides this, timber that is cut in late autumn, and split out, or sawed out before spring, will not "powder post," nor be injured by the worms working in it, nor be injured by the dry rot, as is the case with timber, many times, which has been cut at some other season of the year. Fence posts and stakes, particularly, no matter what the kind of timber may be, when felled and split out in late autumn, will outlast other posts and stakes, of the same kind of timber, which may be cut at a different season of the year, by several

years, according to the time when it may be cut. Reason teaches us that this is so, and the experience of the most successful experimenters in timber, furnish the most indubitable testimony to substantiate this fact.

4. The treatment which timber receives, immediately after it has been felled, affects its durability, and also, its firmness and tenacity, to a much greater degree than many are wont to suppose. For this reason, many farmers, in experimenting on the durability of timber, have failed, almost entirely, to allow this consideration to have any influence at all. If timber, which is intended for rails, stakes, and posts, be felled in late autumn, and allowed to remain in the log, for six or eight months, or half that length of time, with some kinds of timber, its durability will be more or less affected, according to the kind of timber, and no after-treatment will make it as durable as it would have been, had it been split out, immediately, and placed in a favorable situation for seasoning. Timber for posts, or stakes, ought always to be split out and seasoned, nearly, or quite, one year, before they are set in the gronnd. A post, or stake, which is set in the ground, when it is green, will not last half as many years, as a general rule, as they would have lasted if they had been seasoned well before they were set in the ground. The first thing, after timber has been felled, is to split it out into rails, posts, and stakes, therefore, as a very important branch of fencing, we shall treat of

SPLITTING RAILS, STAKES, AND POSTS.

5. It requires the exercise of a little good skill to split timber, *economically*, into rails, stakes, or posts. Any one who can handle a beetle and wedge can split fire-wood, for it matters little how that is split, but if a man *does not know how to split timber straight*, he will be very liable, and indeed very *likely*, to spoil a vast deal of timber when splitting up a tree. The truth is, if he does not know *how* to stick the wedges, and *where* to stick them, he will be very apt to make bad work, even in the best of timber, for splitting well. When we split fire-wood we cleave it the best way that we can, and if it slivers to pieces so much the better. But there is a regular rule for splitting rails, stakes, posts, wagon spokes, staves, and every thing else, and if one does not observe this rule, he will, most assuredly, spoil much timber. If, in splitting anything for fences, some pieces have huge ends at one end, and are run out to a mere splinter at the other end, or if they are not all of about a uniform size, if the operator does not understand his business, and if he makes many short pieces, it would be the wisest policy to employ some one else who will not waste so much timber.

6. In splitting timber for anything, it is best to set the wedges always at the smallest or top end of a log, should there be any difference in the ends. If there is no large checks across the end of a log, take the ax in one hand and the beetle in the other, and make a crack entirely across the end of the log, so as to split it into two equal parts. If there is a large crack, a part of the way across the end, drive in the ax a little, with the

beetle, so as to make a crack entirely across the end. Generally speaking, timber splits the best and wastes the least, by setting the wedges in an old crack or seam. But, sometimes, a log will separate much the easiest directly across the old check. Now, set two iron wedges in the end of the log and drive them both together, and when the end is opened sufficiently, drive in gluts ; if the wedges have been set in the middle of the end, the log will separate usually in the middle. Should it vary a little from following the middle of the log, it is better to let it go where it will, than to undertake to open it at the other end so as to meet the operation, which is attended with doubt and difficulty. Sometimes it is almost impossible to split a log through the heart. This is the case, many times, with black ash, and elm, and button-wood. Logs, many times, have a seam entirely around the heart. When this is the case it will require a vast deal of unnecessary pounding to split it through the heart. Such logs can be worked up far more easily, and economically, by slabbing them, following the old seams; and, many times, when a log has a very tough heart, even if there be no checks nor seams, it is best to split them by *slabbing off* about one-third of the log at once ; this will leave, in a log thirty inches in diameter, a heart piece about ten inches square. If now, the timber be very tough and stringy, this may be worked up by slabbing it. In splitting ordinary timber, the builder must keep in mind, that a round stick or a square stick cannot, very well, be split into three equal parts, because, if we attempt to split off one-third of it at a time, the smaller part is very apt to run out before the split reaches the other end. Therefore, if a square stick be about large enough for three rails, it is best to split it through the center, and then split the two halves of it in the center again, even if the rails should be a little too small, than to undertake to split it into three equal parts ; or, if such a stick, when split into four rails, would make them too small, it would be best to make but two of it, even if they were a little larger than we could desire. We cannot, always, have every rail, stake, or post, exactly of the size we may wish, but the aim should always be, in splitting rails, to have the smallest rails equal to a stick two and a half inches square, and increasing in size so that the largest rails will be equal to a stick four inches square. This is a very good rule to split by ; but, if thought to be exceptionable, it is very easy to split in two those rails which A says are of the right size, and which B thinks are too large for one rail and just right for two. A rail about three inches square, or equivalent to that size, will be pronounced by the great majority of farmers, to be a more desirable size, so far as economy and convenience are concerned, than a rail of any other size. When a man has a saw mill of his own, and timber does not split very well, it might be good policy to saw out his rails, making them about three inches square, but the same timber would build twice as much fence if it were sawed into boards.

7. Sometimes rails are split out of poles, which will make from two to eight rails each ; and, it often occurs, that a pole would make about three

good rails; and if split into four, they would be too small; and if split into two rails, they would be rather large. As it is very difficult, and, usually impracticable, to split a pole into three or five, or seven equal parts, on account of their liability to run out, in splitting, if a pole be too small for four rails, it is best to make but two of it, even if they should be rather large. When a pole is about the right size for six rails, the best way is to split the pole into four quarters, as nearly as we can; and, many times, one of the quarters will be large enough for two rails. The idea should be always kept in mind, that the rule which is observed in riving staves, wagon spokes, and such like, is, *to split a stick through the middle;* and then, take a smaller piece, and split that through the middle, and so on until every piece or bolt is reduced to its desirable size. When a log or rail cut will make about eight good rails, the true way is to quarter it first, and then split those quarters in two. If we attempt to split off of one side one rail, in most timber, it would be sure to run out before it would split half the length of the log. The following cuts will furnish the learner with a more correct idea how a large log is to be split into rails, stakes or posts. In the first place, split the log into quarters, if practicable, whether it is to be split into rails, stakes or posts. Fig. 1 represents one of those quarters split into rails. After a log has been split into quarters, split the quarter in two again, as nearly in the middle as may be. If the workman cannot stick his wedge within half an inch of the center of a quarter of a log at sight, he had better measure the distanct. Now, split these pieces first in the direction *a a a*; then split off the heart rail, *b b*; then split *c c*, and we have three rails. Split the other heart piece like the first, into three rails; split the sap pieces at *d*, and split each piece at *e e*. Sometimes it is better to set the wedge in the middle of a stick, half way from each end, than to set it at the end, when splitting a piece that will make two rails, as at *c c*, for example. When a wedge is set half way from each end in the middle of the stick, if the crack does not run in the middle each way from the wedge, sometimes a blow or two with an ax will start it so as to make it split in the middle; and sometimes it is necessary to set another wedge half way between the middle and the end. A little practice will enable the builder, if he has a little good skill, to split timber very accurately, without spoiling but few pieces. The same rules are observed in splitting stakes as in splitting rails, only it is necessary, first, in splitting a quarter, to make a little estimate how many pieces a quarter or an eighth of a log, will make. In splitting fence posts, it frequently occurs that a piece is too large for one post, and too small for two posts. In such a case, if a stake cannot be split off without its running out, it is best not to attempt to split it again, lest both pieces be spoiled.

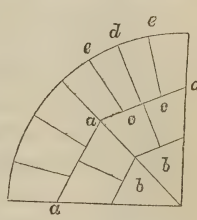


Fig. 1. Quarter of log split into rails.

8. In splitting bar posts, or any pieces that are required to be thin and wide, first split the log in two, and, if it is a large one, quarter it. Make

calculations how many posts a quarter will make, splitting from the heart to the back. If a quarter will make four, split it in the center, and these pieces again in the center. If they are wider than necessary, take off a stake from the heart side, at fig. 2. If half a log will make about six posts, it is not best to quarter it first, because, each pieee then would contain timber enough for three posts, each, and there would be danger of spoiling a post in attempting to split only one post from a stick which is large enough for three; therefore, divide the half log into three equal parts, and first split off a piece large enough for two posts, and then split the pieces in two in the middle. The workman would do well, after opening the end a little, to set a wedge or two in the side of the stick, to prevent its running out, and drive all the wedges at once, or, drive that wedge the most which seems to split the truest and straightest. When timber is not inclined to split exactly straight, by tracing it with the ax and beetle the whole length of the stick, it can be made to split tolerably straight. In splitting a log eight or ten inches in diameter into bar posts or any other wide posts, make an estimate how many a log will make; if it will make four, split it through the center, and then, by tracing or starting it a little with the ax and beetle on the side, the two halves may be split in two again the wide way, as represented by fig. 3. Fig. 4 shows how a log may be split into three bar posts by tracing on the sides as the wedges are driven in the end. We first take off a slab, and if the timber do not split rather freely, it is very liable to run out and spoil a post. It is very impracticable to give a perfect idea on paper of splitting timber correctly.

Fig. 2. Mode of splitting bar posts.

Fig. 3. Manner of splitting a log in 3 bar posts.

Fig. 4. Manner of splitting a log in 4 bar posts.

THE LENGTH OF RAILS AND STAKES.

9. The most common length for rails is twelve feet, although many farmers make them ten, eleven, and even fourteen feet in length, but, when we consult convenience and economy in splitting and handling, as a general rule, twelve feet for rails is the best length. If timber should split very freely there is no objection to cutting them fourteen feet long, on the contrary, if timber should not split well, it might be a matter of good economy to cut them ten or eleven feet long, but there ought to be a uniform length for rails on every farm, because when rails are of different lengths there will be more or less disadvantage in making them into fence. Large logs should be sawed in two, just twelve feet long, and smaller logs may be cut with an ax, and as every rail cut should be measured with a pole just twelve feet long, each cut should be measured from the middle of the chip or ax cut, and the top end of each cut should be left square; this

will make the heart rails a little longer than the outside rails. But, in laying the foundation for a fence, if there should be a little variation in the length of rails, it should be remembered to select first the sap rails, and if the heart rails project a little more than is necessary at the joints it will do no harm.

10. *The length of stakes* should always be regulated by the height of the fence. They are usually cut from seven to nine feet in length, but whatever length may be adopted, it should be kept in mind, that stakes should be cut long enough to admit of being set the second time, after the end which has been set in the ground has rotted off. The part of stakes out of the ground, will, usually, last twice as long as the part in the ground, no matter what the timber may be, therefore, if stakes be cut just long enough to be set but once, after one end is decayed, so that they need re-setting, they are worthless, but by cutting them long enough to be set again, after a foot or so has rotted, it is much more economical than to make new stakes as often as the ends rot or decay enough to render them too short for the fence.

11. Some farmers deem it a matter of economy to cut their fence posts, and particularly bar posts, long enough to admit of the other end being set in the ground after one end has decayed. But there are very plausible objections to this practice. Fence posts which extend from two to three feet above the fence, present an unsightly appearance, and, besides, the longer the post is the more liable it is to deviate from standing erect. Bar posts which extend three feet higher than they ought to, are a nuisance; they are always in the way, especially when one is passing with a load of hay or grain.

12. PEELING RAILS AND STAKES

Should always be done when they are split out, so that they may season the better. It requires but a little time to peel them, when splitting them, and as rails and stakes are often split by the job, at so much per hundred, a man will, usually, split them, peel them, and stick them up, for a few cents more per hundred than he will ask for simply splitting, providing, one insists on it when negotiating about splitting. When timber is cut in the fall, it is true, it does not peel as well as when cut in summer, but, as a general rule, it will peel tolerably well after it is split out, even when cut in autumn. When the bark is thick and heavy it will peel about as well from small pieces, like rails and stakes, as it will when the timber is cut in the summer. But the bark should be taken off at some rate; and when it adheres so tightly that it is necessary to *cut* it off, it may be cut off at each end, about a foot or so, and laid in the fence, with the bark *downwards*, and during the summer it will usually become so loose as to drop off itself, but if it is not held in the joints of the fence, it may be stripped off very readily after one end is loosened a little, and if the rail be laid with the bark down it will become loose by the drying of the rail. When rails are made of timber having a very thin bark, like iron wood, for example, the most expeditious way of peeling them is, to lay the rail to be peeled on a

couple of benches, and then with a drawing knife, shave off the bark while the workman is sitting on it. When small poles are used for rails, if they are not peeled entirely, a strip of bark should be taken off on two sides, opposite to each other, and one of the peeled sides laid upward in the fence; by this means the bark will become loose during the season, and many times drop off itself. Rails, stakes, posts, and timber of every other description will be very much more durable if peeled, unless it is buried in the ground. When a stick is two feet or more under ground, it will last much longer if the bark be left on; but if the bark be left on a fence post, the part of it, two feet below the surface, will be more durable with the bark on than if it were off. But that same post will rot off at the surface of the ground, many years sooner if the bark were left on, than if it were peeled before it were set. Bark preserves timber when it is alive, but after it has been cut down it hastens its decay, when it is exposed to the influences of the weather, wet and dry. When the bark is not taken off worms damage rails and posts of many kinds of timber. Allowing rails to soak in a pond of water for a few days, will, generally, loosen the bark, so that it may be peeled off very quickly.

DISTRIBUTING RAILS FOR FENCE.

13. It is a very common thing, for many farmers, in hauling rails and stakes where a fence is to be made, to distribute them, as to number, entirely at random, without any calculation at all how many will be needed for a fence of a given number of rails high, and, therefore, in some places, twice as many rails are unloaded as are necessary, while in other places there are not half enough. Sometimes, there may be just enough to build the fence, but they have been distributed so unevenly that many of them must be carried too far. When a man is obliged to go twenty or thirty feet for every rail, it will take him twice as long to lay up a fence as it would were the rails left within a few feet of the place where they will be needed. It is a very easy matter to distribute rails for a fence, so that there will be just enough to build it, and it argues a little stupidity and want of calculation, to see one distribute rails in such a manner, that after the fence is finished, there are several loads to haul away. That is all lost labor; and it will consume several hours to haul and unload, and reload and haul away, two or three loads of rails.

14. In distributing rails for a fence, in the first place set a few stakes where the fence is to be built, now calculate how many panels there will be in five or six rods. We will say there are thirty paces in six rods. If the foundation is not laid, the rails may be laid, for thirty paces or so, in a straight line, or zig zag, like a worm fence, and then, by counting the number of panels in thirty paces, and by multiplying the number of panels by the number of rails in one panel, we shall know how many rails are wanted in a distance of thirty paces. Now, let the number of rails required in thirty paces, be distributed close to the place where the fence is to be made, and put them in small piles, with not more than ten in a pile, so that they will be near at hand, and be well spread out, so that small

rails can be selected, if necessary, without tumbling over half a load. Never leave them with nearly a load in a pile, nor in the place where the fence is to be built, lest they have to be removed, nor a rod or two distant, for fear they may be in the way. Now, pace off thirty paces more—it can be done in less than one minute—and drop as many more rails, and in the same order, and proceed in this manner until a job is finished. When the foundation or the first rail is laid, it is a very easy matter to make calculations for hauling just enough to make a fence.

15. Rails of one kind of timber should always be left together, and rails of another kind of timber, unless they are equally durable, should be kept by themselves, because when oak and basswood are laid together the basswood will decay long before the oak, and the result will be, the entire fence must be repaired; whereas, if the oak had been kept together, and the basswood together, no part would need repairing but the basswood. For the same reason, new rails should always be kept together, when repairing fence, and take old ones to supply the place of those which have decayed.

16. When one is hauling rails, which are to be laid in a fence, immediately, it is much quicker to take the rails from the wagon and lay them in the fence than to throw them on the ground and then pick them up again and lay them in fence.

17. When the stakes are to be hauled let them be placed near each joint of the fence, with one on each side of it, because it will save the time of picking them up. When the foundation is not laid, if we know how many panels there will be in a given distance, it is easy to calculate that two stakes will be required for each panel, whether fence is to be zig zag or straight.

18. FENCE BLOCKS

Are a very important item in building fence. It is very poor policy to place rails on the ground or on perishable materials, which will soon let the fence down to the ground. Boulders, from ten to twenty-five inches in diameter, make the best blocks. When one is a little too large, let a hole be dug a foot or so deep, and roll it in. When one is a little too small, put it on the top of a flat stone. A small pile of small bolders, or little stones of any kind, will make a very good block for a corner to rest on. When wood is used for blocks, always place the bark side down, if possible, because they will last many years longer than if the bark side was up. When a round stick is used for a block, let it be peeled, if practicable; but, if not, cut off a strip of bark, three or four inches wide, on one side, and lay that side up, and then, as it seasons, the bark will usually become loose, but if the bark be left on the *top* of blocks it will always hasten the decay. Sometimes a couple of good pieces of broken rails will make a very good fence block. Flat stones, a foot square, or more, laid on the top of a little mound of earth, or on the top of two or three sods, will make capital fence blocks. When one has a plenty of small stone, it is good policy to make a ridge of stone, a foot or so high, and lay the fence on the top of it. This will answer both for a straight fence and for a zig zag fence. Where no stone can be found, and wooden blocks are scarce,

make a corner with square rods and lay on a piece of board, or slab, or two or three short pieces of old rails. *Let the fence be kept well up from the ground at all events.* When a foundation corner is made of earth, or sods, the sides should be covered with sods, to prevent them from washing away in heavy showers.

MAKING A ZIG ZAG, OR WORM FENCE.

19. In making a zig zag fence of rails, there are two modes of laying the bottom rail, by stakes, which I shall lay down, in order to have the fence straight. And when a fence is to remain for a number of years, or is to be a permanent fence, it ought always to be straight, but in making a temporary fence, if a man is mechanic enough to give the fence the necessary worm, he may lay the bottom rail by guess. But the beginner had better have some stakes to guide him; because if he does not he will be sure to give some parts of it much more worm, or crook, than is necessary, and give other parts so little worm that it will barely stand alone. When a fence has too much worm, or crook, it is a good fault, it will stand more firmly, but it requires more rails. But when it has but little worm it requires less rails, and the first driving storm may throw it from its foundation and prostrate it.

20. The first step then, will be to set a number of small, thin stakes, six or seven feet high, in a line, where the middle of the fence is to be made. Now make a fence rule, fig. 5, which consists of a stick, either round or square, about seven feet in length, as large as a fork handle, and pointed at the lower end. If the ground be stony and hard, the lower end ought to be fitted to an iron socket, pointed. Bore several half inch holes through it, for the rod R, which should be made of a very tough piece of wood, about as large and elastic as a good whip stalk. This rod should be about three feet long, and then it may be graduated by making a mark for two feet, and for two feet three inches, six and nine inches. This rod should be merely pressed into a hole, without fastening it, so that when laying a foundation on very high or low blocks, it may be raised or lowered as may be necessary. Always work up hill in laying any kind of rail fence, because, when we begin at the bottom of a declivity and work upwards, the rails will lie more level than the inclination of the ground, and if we work down a declivity the rails will be more inclined than the ground, and will not stand as firmly as if it were made by working up hill. When a string of fence extends over rolling or undulating land, the proper mode of making it is to lay the bottom rail the whole distance, and then go back and change those corners in that part of the fence which was laid by beginning at the top of a declivity, so that in laying up more rails the operator can work up hill, both ways, from a valley. The next thing in order will be to decide upon

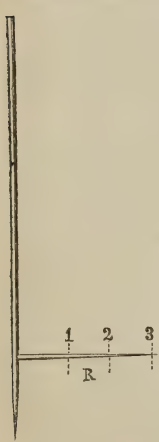


Fig. 5. A fence rule.

THE AMOUNT OF WORM, OR CROOK FOR A FENCE.

21. The *length* of rails must, usually, determine the amount of worm for a fence. Long rails require much more worm, or crook, than short ones, in order to have the corners of each kind of rails of the same angle. Suppose, for example, that rails are nine feet long, and we give the fence, which is made of them, three feet worm, *i. e.* the fence will occupy, measuring across the fence, three feet of ground, from the center of one joint to the other. Now, if rails are fourteen feet in length, in order to give the corners the same angle of the nine feet rails, we must give these rails a crook of four feet eight inches, measuring from the center of one joint to a point opposite of it, in a line with the joints on the other side of the fence. Where fence is to be staked, the rule for the amount of worm, which is most commonly adopted, is, that it be equal to one-third the length of the rails. This is enough for any fence that is well staked, and where a fence will not be exposed to furious winds, it may answer just as good a purpose to give it *less* than one-third the length of the rails. But where a fence is not to be staked and the rails are rather light, the worm should be increased, so as to be at least five-twelfths the length of the rails, and sometimes even more than this.

22. If the stakes are all stuck in a line, plant the fence rule in a line with the stakes, where we are to commence laying the foundation, having the rod R standing at a right angle to the right or left of the line, which would cut the fence rule staff and the stakes. If the fence is to have a worm of four feet, which is about right for rails twelve feet in length, place a fence block under the rod R, so that the center of the block will be just under the two feet mark from the rule staff. Lay on a good straight rail and carry the rule forward, and plant it down in a line with the stakes, nearly opposite the other end of the rail, with the rod R extending in the opposite direction. Place a block beneath the two feet mark, on the rod R, and lay on the end of the first rail, and then lay on another rail, and carry the rule along, and lay another block in a line with the first block, and so on.

23. Many fence makers, in laying up rails, have the ends of the rails extend beyond the points of conjunction at the corners about one foot. But this practice uses up more rails than is necessary to build a fence a given number of rods in length; and, besides, when the ends of the rails extend beyond the joint, from ten to twelve inches, a fence does not look as well, and is far more liable to be thrown down by the whippletrees catching it, or cattle rubbing against it. If the ends of the rails extend three or four inches beyond the joint, a fence is no more liable to be thrown down than if the same rails extended a foot beyond the joint. It is very important that all the rails should lie, at the joints, one directly above the other. The smallest rails should, always, be laid at the bottom of the fence, and the largest ones, if there be any difference in the size of them, should be laid on the top, as heavy rails on the top renders a fence, whether

it is staked or not, much more substantial than if the large rails were in the middle of the panels, with small ones on the top. If there should be any difference in the size of the ends of the rails the large ends should be laid at the lowest corner. When there are many crooked rails, make a panel or two of crooked rails, placing those together that are of nearly a uniform crook. If there are but few crooked ones reserve them for the top of the fence. After a fence is laid three or four rails high, if flat stones, three or four inches thick, are at hand, it is a good practice to lay one on each joint, as they will make the fence about one rail higher, and at the same time it will subserve just as good a purpose as if a rail was in the place of the stones. And another advantage is, flat stones laid on the joints will turn the water from the joints and render them more durable, as rails often rot at the joints, in consequence of the wet finding its way there and not drying out. A large flat block of wood will answer for this purpose, in the absence of flat stone. Roundish stone in such a place would be liable to throw the fence down. Low corners of a fence may be brought up level with the others by laying on a flat stone between every two rails.

24. ANOTHER MODE OF LAYING THE FOUNDATION OF A WORM FENCE, Which some people prefer, to laying with a fence rule (fig. 5), is to set two rows of small stakes the whole distance where the fence is to be built, with the rows just as many feet apart as there is to be given to the worm of the fence. If the worm is to be four feet, set the rows four feet apart; if the worm is five feet, set the rows of stakes five feet apart. Now lay a fence block in range with one of the rows of stakes, and lay on a rail, diagonally, from one row to the other; then lay another fence block in range with the other row, under the other end of the rail, and so on. In order to ascertain whether the block is in range with the stakes, stand in range with the stakes, and set a stick, about as large as a common fork-handle, *perpendicularly*, on the top of the block before you, and if, when it stands in the middle of the block, it is in range with the stakes, the block is in the proper place. By placing the trying stake, or stick, in range with the rows, the workman will readily perceive which way the block, or corner, must be moved, in order to bring the corner in range with the stakes.

25. There are other modes of laying the foundation by stakes, but they are so inferior to those already mentioned that we shall omit to notice them.

26. A common worm fence may be staked and capped, staked and ridered, staked and wired, locked and ridered; or it may merely be laid up, without either stakes or riders, or locks, but whichever mode is adopted, the operation of laying the foundation, and of building the fence, several rails high, is the same in each kind of fence, with the exception, that a staked fence does not require as much worm as one that is not staked.

LOCK AND RIDER FENCE.

27. Fig. 6 represents the manner of finishing a worm fence, with locks and riders, which will resist the wind as well as some staked fences. The

fence is first laid as many rails high as is desired, and then the largest rails are laid, in a straight line, from panel to panel, as in the figure. The locks may be good stakes, or pieces of rails, placed in the nook of the fence, formed by two panels, and inclined into the corner, formed by the top rail and rider. The

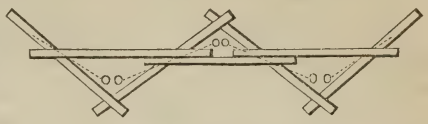


Fig. 6. Lock and Rider Fence.

dots in the figure show about where the foot of the locks should be placed. The locks are not, usually, set in a hole in the ground, although, if they were, the fence would be stronger. Sometimes the riders, in this kind of fence, may be long poles, extending the distance of several panels. Long poles are much better than rails for riders.

28. Another mode for locking a fence is shown by fig. 7. The fence is first made as high as it is to be made, and then the locks, which may be of good rails, or stakes, or pieces of rails, are stuck in the ground, as shown by the dots or circles, and leaned on the corners,

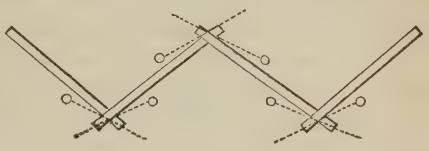


Fig. 7. A Lock Fence.

as shown by the dotted lines. In locking in this manner the builder must exercise a little skill, if he has any, in regard to setting the locks, so as to *bind well.* If they are not placed on the correct side of each other they will not lock the fence, by wedging, any more than their own gravity will lock it. It is not very convenient to show on paper which lock should be on the outside, and which on the inside. If the builder has any skill he can alter the position of a pair of locks until they seem to wedge, or bind, more than they will in any other position, and then let the position of those locks be carefully observed, and let them endeavor to set the rest as nearly like them as is practicable. They should not be set too perpendicularly nor too slanting, because if set too slanting they will not resist as great force as if they stand more perpendicularly, and if they be set too perpendicularly the lock is not as binding; and if the locks extend several feet above the fence, the wind is very liable to blow them over. If the locks be small stakes, or small rails, the foot of them must be placed almost close to the side of the panel which it locks; but if they be large they must be placed farther away from the panel. Locking a fence is adopted more for a temporary fence than for one which is to remain for a number of years, and when stakes are at hand for locking, and a fence encloses a field of grain, it is more safe for the security of a crop to stake it, even if it were to remain but one season. A locked fence is always getting down, and when a fence stands in a very bleak situation, where the wind is liable to prostrate it, it is folly to attempt to keep it up without having it firmly staked. Locking a fence according to the first mode of locking may be adopted with safety, providing the last rails, which extend from panel to panel, are very heavy, and the locks well rammed into the ground.

STAKE AND CAP FENCE.

29. Fig. 8 represents two different modes of staking a zigzag fence. The black dots show the situation of the stakes. After the foundation has been laid the stakes may be driven, or the fence may be made four or five rails high, before the stakes are stuck. In either case the holes should be made with a crowbar, at least twenty inches deep, and then, as one man stands on a bench and drives them with a sledge-hammer, another man should keep them erect. In order to expedite setting the stakes, let the holes all be made first, and then let one hand get the stakes and place them in the holes, and hold them while another man lays his sledge hammer on his bench and carries them along from joint to joint, and drives the stakes. Let the stakes all be sharpened for driving, and the top ends dressed off, so that the caps will go on readily, before they are brought on the ground. The most expeditious way to sharpen a lot of stakes is to have a large flat block of wood for the stake to stand on, while it is held erect with one hand and sharpened with an ax in the other hand. Cut a little hollow in the top of the block, so that the stakes, when being sharpened, will not slip off the block. The stakes must be sharpened true, or else they will not drive well (See Sharpening Posts, par. 160). When the fence is made four, five or six rails high, as may suit the caprice of the builder, the caps are put on, and then one or two rails more are laid on the fence. If stone can be obtained of sufficient size, one may be put between each pair of stakes, under each cap, and one above each cap, which stone will carry up the fence the height of two rails. Some farmers put on two caps to each pair of stakes, when the fence is to be unusually high, but when stakes are driven twenty inches, or more, in dry ground, and a cap put on, three or four feet from the ground, two caps are not necessary. In lieu of caps many farmers use wire for holding the stakes together, which, by many, is considered preferable to caps. Good annealed wire is used, about No. 9 or 10 is the right size (see fig. 30), and after being put around a pair of stakes, and cut partly in two with a file and broken, the two ends are either hooked together or twisted together. If the wire be large and stiff it is best to hook the ends together, as they can readily be taken off the stakes when it becomes necessary to repair the fence. Wire is cheaper than caps, when one must advance cash for making them, and by drawing it up tight around the stakes it will bury into them, and the weight of all the rails above the wires will rest on the stakes, thus tending to keep the stakes in the ground when the frost has lifted them upwards. A fence, with the stakes set at each joint, one on each side of the fence, will resist a greater force than when they are set in the acute angles *on each side* of the joint, as shown in the figure.

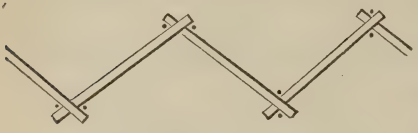


Fig. 8. Stake and Cap Fence,

MAKING FENCE CAPS.

30. The most expeditious and cheapest way of making fence caps, when a saw mill is near at hand, is, to have the logs sawed into stuff about two by seven inches, or one and a half inches by seven, and then, with a circular saw, cut them off the length desired, and bore them. But, when timber will split freely, more caps can be made of a log by riving them out than by sawing, when the log is about twice the diameter of the width of a cap. The logs are sawed off the length of caps and split into quarters with a beetle and wedges, and then with a cooper's froe, (fig. 9,) an instrument used for riving timber, and with mallet, the caps are split out, by setting the froe in the middle of the stick to be split. (See splitting timber, 5 and 6.) When caps are split out one side of them will, usually, be thicker than the other. The average thickness of the caps is a matter of fancy. Some make them one inch, some two inches, some three or four inches thick. The thicker the caps are the more they will aid in carrying up the fence to a given height. If caps be made as thick as a rail, they carry up the fence as much as one tier of rails, and, at the same time, subserve the purpose of caps, and make a fence stronger than thin ones, which are liable to split very easily. There is nothing lost in making caps four inches thick, for it requires much less timber to make such a cap than it does to make a rail, and a man can split out four times as many caps in a day as he can rails, and if they be thick as a rail, they will save one rail to a panel, the entire length of the fence.

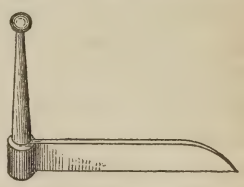


Fig. 9. A Cooper's Froe.

31. The length of caps must be determined by the size of the rails, the size of the holes in the caps, and the amount of worm in the fence. These three considerations, combined, will enable the builder to cut his caps of the correct length. It is necessary, first, to ascertain, if we can, what is about the average size of the rails. If they will average from three to four inches in diameter, the worm of the fence being from three and a half to four feet, the holes in the caps should be from five to six inches apart. Now, six inches between the holes, added to the size of the holes, which are usually about four inches in diameter, makes fourteen inches, added to three inches at each end, between the holes and the ends, will make twenty inches, the length of the caps. Slabs which are cut from logs, at saw mills, will make good caps, and as they can, usually, be purchased at a low price, they will make very cheap caps.

32. BORING FENCE CAPS

Is often done by hand, in the winter season, when farmers have but little to do. Two hands can bore one hundred or more in an hour, when they are not more than two inches thick.

33. There are various kinds of augers for this purpose. The kind which may be worked with the least power, is a hollow auger, which cuts a circular ring through the cap, of the size of the hole, taking out a core from the center of a hole. This kind of augers are not capable, generally, of boring caps, which are more than about two to four inches thick.

Their cost is from four to ten dollars, according to the work expended in fitting them up and making a bench for one. But when caps are to be bored by hand, an ingenious mechanic may get up an auger, bench and all, for about two dollars, which will perform well, and bore all the caps which will be required on one farm. When an auger is driven by horse power, or steam, or water, the mandrel which holds the auger must be of iron, having its bearings turned and polished ; but when boring is done by hand, the mandrel may be turned out of a very tough and hard piece of wood, with a kind of large center bit firmly fixed in the end of it for the auger, with a crank at the other end. An ingenious blacksmith will make, for fifty cents, a center bit, with a square shank, six or eight inches long, for fastening it in the wooden mandrel. The caps are placed on a slide, which is made to move towards the auger by a strap being attached to it and passing over a pulley and fastened to a foot treddle. After the hole is bored the slide and cap are pulled back with the hands. The whole of it is so simple as to hardly require a description. Sometimes the cap is fed towards the auger by a screw, working in a stationary part of the bench, but feeding with a strap and treddle is the most convenient and quickest way to bore caps.

BUNK AND CAP FENCE.

34. Figure 10 represents a bunk for fence similar to the stake and cap fence, with the exception that the stakes are set in a block about four feet in length, instead of in the ground. These blocks may be as large as one man can handle, or they may be small as a rail of the largest size. The larger they are the more substantial the fence will be. The holes for the stakes should not be less than three inches in diameter and should be bored entirely through the pieces in order to allow water to work out at the bottom. When a stake is a little too small it may be made tight by a wedge on one side of it. This kind of fence may be straight or zig zag, and all the advantage it possesses over other stake fences is, it can be removed more easily. It requires more timber and time to make it, and is not worthy of adoption, generally, excepting in localities where stakes cannot be driven in the ground. When this kind of fence is made straight, the ends of the rails, in the bunks, may lay side by side, or, one above the other. When they lay side by side, pieces of rails must be sawed just long enough to lie between the stakes, for the purpose of raising the next tier of rails several inches. When this mode is adopted it will require as many short pieces as there are rails to carry it up to the caps. This fence possesses one good quality over a stake fence—it will not be lifted by the frost and is more easily kept erect.

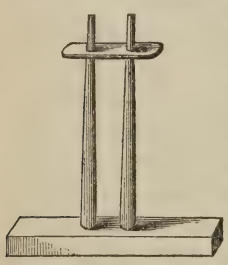


Fig. 10. Bunk for Rail Fence.

STRAIGHT RAIL FENCE.

35. Figure 11 shows a section of rail fence built with the rails in a straight line. The stakes are first set just far enough asunder to receive

a rail of medium size. Then turn two furrows with a plow, towards the fence on each side of it, throw up the second furrow with a shovel so as to form a ridge one foot or more in height, leaving it one foot broad on the top, so that the rain will not wash it down too much. Let grass seed be sowed on this ridge. By throwing up a ridge the stakes stand more firm and are less liable to heave by the frost, and cattle do not have so much advantage in endeavoring to get through it, or over it, and besides, it saves twice as many rails as a man could split while he is casting up a ridge. Blocks of wood or stone may now be placed close to the stakes, on the ridge, for the fence to rest on, or an inch pin of durable and tough timber, may be put through both stakes, for supporting the rails. When the fence is merely to stop horned cattle and horses, the pin may be one foot above the ridge. Lay the fence two or three rails high, laying between the stakes stones or blocks of wood, at pleasure, and then put in another pin, or put on a wooden cap, or a wire. When a rail is too large cut it away with the ax, so that it will fit tightly between the stakes. Reserve the largest rails for the top, and keep the crooked ones in a panel by themselves.

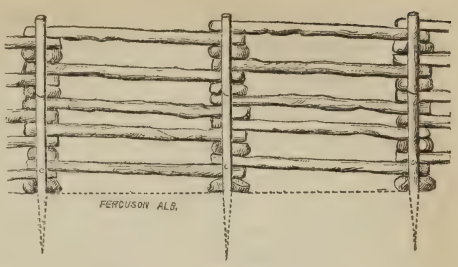


Fig. 11. A Straight Rail Fence.

36. This is the most economical rail fence that can be built for every kind of stock; every one likes it, and it possesses all the commendable qualities that any fence can claim; it occupies but little space, requires but few rails, is strong and substantial, and looks neat and farmer-like. It may with propriety be denominated *the farmer's own fence.*

37. THE HORSE FENCE, OR SKELETON FENCE,

Which is repaesented by fig. 12, is a straight fence, constructed of posts, rails and wire, in the following manner: The posts are first set firmly in the ground, as far apart as the length of the rails, allowing the rails to extend by each post two or three inches; a line is then struck on the posts, as in building board fence (see par 100), as high as the top rail is to be placed, then strike two more lines below the first one, as far apart as desired; the two top rails may be one foot apart, and the two next one foot or ten inches. Now, with a half inch bit, bore the holes through the posts at each mark at right angles with the fence, then have two light benches, just high enough to set under the bottom rail, when it is raised as high as it should be on the side of the posts; let the benches be placed so as to hold the rail about where it is to be fastened, and, with a wire running through the posts, fasten it around the end of the rail,

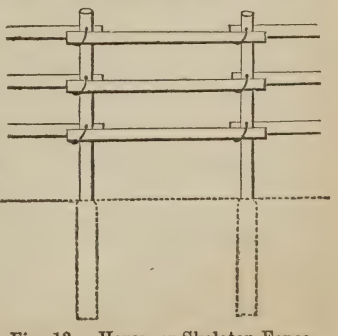


Fig. 12. Horse, or Skeleton Fence.

by twisting the ends of it firmly together. Carry the first bench forward to the next post and lay up another rail, and put a wire through the post and around the ends of the two rails, a rail being on each side of the post, and twist the ends together. Carry forward the next bench and lay up another rail, and so on until the lower rails are all put up. Put up the second rail, letting one end rest on the bottom rail while the other end is being made fast. When more than one hand is at work putting up rails, the benches may be dispensed with, but one hand alone will find it very difficult and inconvenient putting up the first rail without a bench to hold up one end while he is fastening the other. It will be understood that the wire passes through the post and clasps the rails, and on the under side of the rails the wire is on the outside of the post.

38. Some men prefer having two holes bored through the post for every tier of rails, and having a hole in each end of the rails, and the wire put through one rail, then through the post, then through the rail on the opposite side of the post, and then through the post again. But it requires far more labor to make the fence when two holes are made through the post for each tier of rails, and a hole in the end of the rails also, and it makes a fence no better, in any way, than when but one hole is made through the post for each tier of rails, and, besides all this, when the holes are made through the rails as well as through the posts, they must be bored very exact, or it will be difficult putting the wires through. When the wires pass entirely around the rails, if they are twisted up tightly the rails cannot be got out without breaking the wires. This is a very cheap and substantial fence, and will turn horses and large cattle about as well as a fence seven rails to a panel. It is a great improvement to cast up a ridge along this kind of fence, as neither cattle nor horses can push against it with as much force as when the ground about it is all smooth and level. If the rails be unusually large the holes in the posts may be bored farther apart than one foot.

39. The principal reason why many fail in building this kind of fence is, they do not use posts sufficiently large. Many use only stakes, driven eighteen or twenty inches into the ground. But in order to have such a fence stand well, the posts should be as large as for an ordinary board fence, and should be set as deep as for a board fence; then if an unruly animal thrusts his head through he cannot throw off the top rails, nor push away the bottom ones; he must necessarily break the wires or rails, or demolish the fence, in order to get through, and any animal that will do that should not have his liberty in an open field.

THE LOG, OR POLE FENCE.

40. Figure 13 shows the mode of building a fence with logs, or large poles or rails; they may be cut as long as they can be handled conveniently. When a fence is made of logs, one end of them should be spotted with an ax, so that they will not roll off

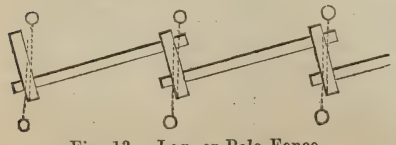


Fig. 13. Log, or Pole Fence.

at every touch of an animal. When one has lots of timber that is of but little value, it may be worked into a fence in the logs, at very much less expense than to split it into rails. Logs thirty feet in length may be used for the two first tiers, and may be rolled to their places on the fence with a team. When it is one or two logs high it may be finished with heavy poles.

41. When this kind of fence is made entirely of poles, the cross panels may be made of the sound pieces of old rails, or of pieces of poles. In either case the corners should be spotted, so that they will not roll.

42. When one has a large lot of sound pieces of old rails, they may be used up to a good advantage in building a rail fence in this manner. When such a fence is made of rails, in order to have it straight, stick a row of stakes, and lay one corner of the fence in a line with the stakes, cut the lower sticks, for the short panels, about two and a half feet long, and place the next corner as far from the first as it will admit of, and lap a few inches at each end, laying the short panels at a right angle with the rails. As the tiers of rails are laid on, the ends should be laid inwards a little every tier towards each other, so that when the fence is about five rails high the top rails will lay in a straight line, with their ends side by side. The pieces for the short panels should be shorter in length at each tier, and the top ones may be not more than one foot long. This kind of fence should always be staked, and after it is staked the ends of the rails will touch the under side of the stakes from the bottom to the top of the fence. The place for each stake is shown by the preceding diagram. The heaviest rails are laid between the stakes for riders, and if large poles, as long as two rails, can be obtained for riders, the fence will be much stronger than if it were made entirely of rails. This kind of fence is to be staked with stakes not sharpened, but set in holes dug with a pick or mattock, whose blade is about two inches wide.

43. I may be allowed to remark here, that but few men know how to dig a stake hole correctly. We often see the man stand facing the fence when digging the holes; this is decidedly wrong, because when standing in this position, the earth, which should all remain unbroken and solid, to keep the stakes from tipping up when the riders are laid on, is all broken up, and the stakes tip up very readily; but if the digger will stand with his *side* to the fence, and dig a long deep hole, leaving an unbroken bank for the end of the stake to raise against, it will be almost impossible to make the ends tip up by laying on any amount of heavy riders. It matters not how long the hole is dug in the direction of the length of the fence, but it should be dug to fit the stake. It should slant in the direction of the stakes when the riders are on the fence, and be just wide enough to admit the end of a stake when it is thrust into the hole with a man's whole force. When the stakes are large, and the rails large also, the stakes must be set more slanting than when the rails are very small. If stakes be set rather straight up and down, they may be in the correct position for a small rail, but if the riders were large there would be too much space between the

rails and riders. Two riders are usually laid in such a fence, although many farmers use but one. The under rider is laid with one end in a pair of stakes, and the other end under the next pair of stakes. The upper riders, of course, are laid in the stakes, with both ends above them.

THE ROD FENCE

44. Is a great favorite among some farmers because of its substantiability. This kind of fence is made like the zig zag stake and rail fence, with an iron rod passing through all the rails, at the joints. Iron rods from three to four-eighths of an inch in diameter, and about four and a half feet long, are set in a fence block two or three inches deep, and then a pole about three-fourths of an inch in diameter is bored through each end of all the rails, after which they are slipped on the rods. To save rails, pieces of rails may be sawed up about four or six inches long, and bored and put on the rods. It is not necessary that the rods be made very tight in the fence blocks, for the force of anything against the fence is merely in a horizontal direction, and when all the rails are laid up the fence will resist quite as great a force if the rods enter the blocks loosely, as when they are made tight.

45. When boring the rails some eight or ten of them should be laid on two benches, and the holes made at an equal distance, measuring with a thin strip of board, or the like. The holes should be at least one-third larger than the rods, and care and skill must be exercised in boring them, and have them true with each other. If one hole slant a little one way, and the other hole be straight through, or slant a little in another direction, it will be very difficult getting the rails on the rods, on account of their binding on the rods. If it were desired, a head could be made on the lower ends of the rods and a nut and screw on the upper ends, and they could pass through the blocks and rails and be screwed up tight. Let a small hole be drilled in stone blocks for the end of the rod.

46. THE SIDE HILL OR GUN FENCE,

A section of which is represented by figure 14, is made with small stakes and short pieces of rails, or it may all be made of stakes only, four, five or six feet in length, pointed and driven in the ground. The rise of the ground where the fence is to be made will determine the length of both rails and stakes. Where the ground is so steep that an animal, horse or ox, can scarcely ascend or descend, the horizontal pieces may be only four feet in length and the stakes four feet. Two stakes are required for each rail. Slabs placed edge ways in the stakes,

Fig. 14. Side Hill, or Gun Fence.

will lay up much faster with a given number of stakes than pieces of rails or stakes.

47. The first step in building such a fence on level ground or up an acclivity, is to plow a narrow trench, from eight to twelve inches deep, and where the ground is too steep to be plowed, a narrow channel may be dug with a pick or spade. Commence at the foot of the hill and lay one end of the slab or piece of rail on a large stone or block of wood, or a short post driven in the ground, and the other end in the trench, and stamp the dirt on each side of it to keep it on its edge. Set a pair of stakes so that they will rest on this slab, as shown in the figure, and then lay another slab in the crotch of the stakes, with one end in the trench, and stamp in the dirt with the foot, as was done with the first one. When this kind of fence is built on level ground, slabs of almost any length may be used. Long ones must be placed more horizontally than the short ones. When slabs are of various lengths, those of one length should be placed together, in order to make the fence of a uniform height. Whatever may be the length of a slab, the end of the first slab above the ground should be elevated just as high as the fence is to be made, and as the other slabs are laid in the crotch of the stakes care must be exercised to keep them all of about the same inclination as the first one that was put up. If, for instance, one has been making fence of slabs sixteen feet long, and wishes now to use slabs twelve feet in length, in order to have the fence of a uniform height, the slabs twelve feet long must be placed more perpendicularly than those sixteen feet in length. Let the builder always remember to place the largest end of a slab in the ground.

THE PARK FENCE.

48. Figure 15 is a representation of a fence which will turn almost any thing that ought to have its liberty in the fields. This fence, where timber is cheap, is the cheapest fence that can be built, for a high fence. The first step in building it is, to plow a deep trench, and then make holes with a crowbar in it, as far apart as the stakes are to be stuck. Have a long plank bench, standing by the side of the fence, and let one man put the stakes in the holes and hold them perpendicularly, while another man drives them. The stakes may be from three to eight inches apart, in the clear, according to the size of the animals to be turned. One side of the tops should be kept in range with each other, so that a narrow strip of board may be nailed to each of them. At the distance of about every ten or twelve feet, a stake two or three feet longer than the rest should be set, for holding wires, which may be fastened to the stakes with staples, or

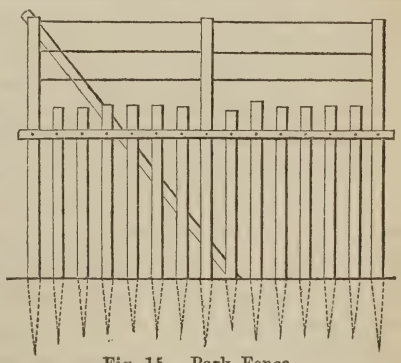


Fig. 15. Park Fence.

they may pass through the stakes in holes. Wire as small as number twelve would be sufficiently large for this purpose. After the stakes are all driven there should be two or three furrows plowed on each side of the fence and cast up against the stakes with a shovel, and grass seed sowed on it. When such a fence is made of durable timber, well seasoned and well made, it will need no repairing, ordinarily, for a score of years.

STAKE AND RIDER FENCE.

49. At figure 16 the ordinary mode of finishing a worm fence with stakes and riders is shown. The stakes are set about one foot deep in the ground, the holes having been dug with a pick, about from eighteen to thirty inches from the fence, according to the size of the rails and the height of the fence, before it is staked, and the amount of worm which is given it in laying the foundation. The higher the fence is before it is staked, and the larger the riders are, and the more worm there is, the farther the foot of the stakes must be set from the fence. The dotted lines show the position of the stakes; and it will be discovered, that at every alternate corner of the fence, they are placed with the *opposite sides together*. This is a very important consideration in staking a fence of this style, which men of experience well understand, but which the beginner does not always perceive very readily, and those who do not understand the practical importance of it, place every pair of stakes alike, and the consequence is, the spaces between the riders are very much too wide. We will suppose, for instance, that in making a fence like the figure, we commence at a certain point and work west. The stakes on the north side of the fence *a a a*, must be placed on the east side of those on the west side, and the stakes at *b b*, must be placed on the west side of those on the south side of the fence. This is important only when the lower rider is placed with one end in the crotch of one pair of stakes and the other end under the next pair. For the lower riders rails of small size should be used. When no cross rider is used, the first or lowest rider being laid, with both ends in the stakes, each pair of stakes may be set just alike. Let the outside stakes all be set in a line, as nearly as may be, so that in plowing the plow may be run straight along by the foot of them. Set the foot of the stakes at a right angle with the fence, and not diagonally, either way, because, when set so as to lean on the fence in a diagonal direction, the spaces between the riders will often be rendered wider, and a fence will not stand as firmly as if the stakes were standing at a right angle with the fence. The *height* of this style of fence, before it is staked, must depend on the size of the fence blocks, the size of the rails, and the ultimate height of the fence. When the fence blocks and rails are of a good size, and animals orderly, and riders heavy, four rails high before staking, and two after staking, will make a good lawful fence, and

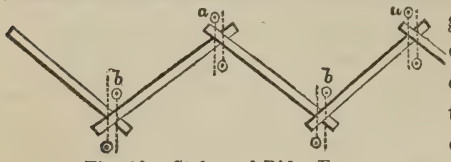


Fig. 16. Stake and Rider Fence.

any animal that would pass it, by leaping over it, or by demolishing it, should be hampered without delay, or placed in a field which is fenced with a

DOUBLE STAKE AND RIDER FENCE.

50. Figure 17 represents the manner of staking and ridering a fence in a twofold manner. The fence is first made like figure 16, and then long poles, or rails will answer, are laid on the top of the riders, and staked as shown in the figure, and heavy rails, or poles, are laid in the stakes. It is very convenient sometimes to have a yard or small field enclosed with such a fence, where a bull or stallion may be turned loose without any fears of their getting out of their proper place, and if it is enclosed with such a fence, any animals that are let loose within such an enclosure are obliged to remain there until they are allowed to go out at the gate.

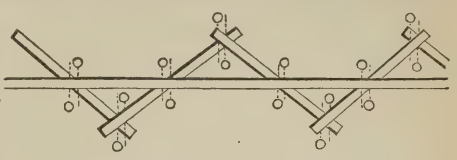


Fig. 17. Double Stake and Rider Fence.

51. THE GUARD FENCE

Is sometimes one of the most economical rail fences that can be erected. When one has but few rails at hand, and a temporary fence is needed for a few weeks, the guard fence is a very economical and convenient mode of fencing. It not unfrequently occurs that it is necessary to fence a narrow way across the end of a field, where the cattle are to be driven to a distant field every day to pasture or to water. Sometimes, also, it is very desirable to have a temporary fence through a field, for the purpose of allowing a team to graze for a few hours where there is good pasture, while there may be grain in one part of the field. This style of fence is not designed to turn cattle, only while the eyes of some one is on them. It is made two or three rails high, zigzag, or straight. Stakes, or crotches, are driven into the ground, so that the bottom rail, when resting on them, will be about two feet from the ground; stake them with anything that will not decay while the fence is needed, and lay on one rider, or two, as may seem best. If two riders are used, the lower rider should be laid with one end in the crotch of one pair of stakes, while the other end is under the stakes. This style of fence will often subserve as good a purpose as one which would cost four or five times as much as this.

52. POST AND BAR FENCE

Is a style of fence which many farmers seem to admire more than almost any other, but it is not economical, as a general rule, because of the great amount of labor required to build it. The posts are mortised similar to bar posts, and the rails are split from five to six inches wide, and about two inches thick, and the ends of two bars, one on each side of the post, are dressed off, so that two of them will enter one hole. There can be no objection to this fence save the expense of labor in building it. When a post and bar fence is built of durable timber, and in a workmanlike man-

ner, it will stand without any repairing as long, and perhaps longer, than almost any other rail fence.

53. POST AND RAIL FENCE

Is made similar to post and bar fence, only in this style: A round tenon is made on each end of all the rails, which are well driven into round holes in the posts. When a fence is built in this manner, the tenons should be well smeared with coal tar or paint, to exclude the wet, as in such places they would be very liable to decay in a few seasons if unpainted.

A post and rail fence may be made a self-sustaining fence, by boring the holes in round sticks for corner posts, at such an angle that the rails of each panel will be about the same angle of an ordinary rail fence. But we would not advise the builder to attempt to erect such a self-sustaining fence, for he would most assuredly wish, in a few years, that he had never seen such a fence. There are several other styles of rail fence, which we have not adverted to, because we do not consider them worthy of adoption.

BARS AND BAR POSTS.

54. Bars should always be made of light timber, when they are made to be let down, so that children can put them up without difficulty. The lightest rails should be selected for bars, when the rails are being over-hauled, so that no time may be lost in searching for them when they are needed. The neatest bars are made by having a log of some light timber sawed into bars, about inch and a half thick by four or five wide; one log will make a large lot of them, Bar posts should be not less than eleven or twelve feet apart, as that amount of space is none too great to allow a load of hay or grain, or some of the implements of the farm to pass through freely.

55. SLIDING BARS,

Represented at figure 18, are the most convenient style for bars, especially where bars are used very often. Three bar posts are set so that the bar holes will exactly range with each other. Two of them should be set about four feet apart, and two about eleven or twelve feet apart. The bars should be sawed true and straight, and in opening the barway they can be pushed back, as shown in the figure. Such bars are much more convenient than those which must be let down or taken out when anything is to pass through.

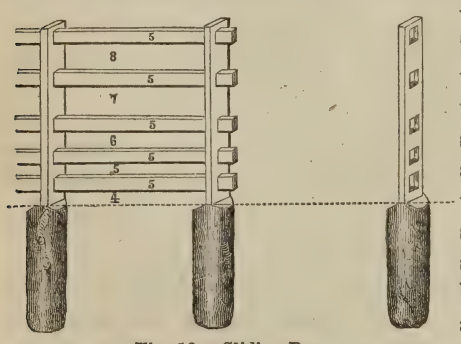


Fig. 18. Sliding Bars.

56. Cattle, horses, and some other animals sometimes acquire the vice of letting the bars down, and thus opening the way on to forbidden ground. This may be prevented by boring a hole on each side of one of the posts

through which the bars slide, and by putting in pins. This is better than to wedge the bars in the mortises.

57. Bar posts (see splitting bar posts, 8,) should be hewed out straight, as they are sometimes winding, and all the mortises should be parallel with each other. If the sides of a bar post are winding, an unskillful workman is very liable to make the mortises crooked, or not parallel with each other, and the consequence would be that the mortises in the different posts would not range with each other. Good slabs, which are cut from logs at saw mills, will make good bar posts.

58. Fig. 19 represents the manner of making a bar post so as to connect a fence with it. If the post is ten or more inches wide, it will be wide enough for the bar holes or mortices, and a row of round holes for the ends of rails. In case the post is not wide enough for a row of holes for the ends of the rails, a stake may be set on one side of it, with pieces of boards firmly nailed on from the post to the stake, for supporting the rails. The mortises should be not less than two inches wide; and the length of them and spaces are shown by the figures. The mortises for the top bars, when bars are made to be let down, must be a little longer, up and down, than the bottom ones, so as to allow the other ends of the bars to go down to the ground. For sliding bars, the mortises need not be much longer than the width of the bars.

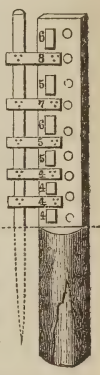


Fig. 19. Bar post.

59. Repairing bar posts is something that is seldom thought of by those who have lots of bar posts which have rotted entirely off at the surface of the ground. The tops would last, many times, fifteen years longer, but the lower ends of them have decayed. Let such posts be pinned firmly to a strong stake or two, and an old bar post will subserve the place of a new one.

60. Bar posts should be made on stormy days and in the winter, when the forces of the farm are not engaged in the operations which demand attention at some particular season. To aid the beginner in laying out the mortises for a bar post, take a narrow strip of thin board, and cut notches in it, so that it may be laid on a post and the mortises and spaces marked off correctly and alike on all the posts. The length of the mortises and width of spaces must first be laid out correctly on the marking board, and then there will be no danger of mortising a post wrong.

BOARD FENCE.

61. There is no limit to the different styles of board fence. Boards of all widths and lengths have been worked into fence; and in half the instances, the builders have never stopped to inquire, whether they are using up their timber in the most economical manner or not. I have no apprehensions of being charged with making a random assertion, when I affirm, that were all the boards which are worked up through the country, in building board fence, sawed in the most economical forms and sizes for board fences, just twice as much fence could be made with them, and the fences

would be just as permanent, efficient and durable as they now are. There is not half the economy exercised, in preparing the materials for a board fence, that there is in building fences of other descriptions. Farmers, too, often trust to a sawyer to saw their fencing of the different sizes, which *they*, (the sawyers,) may think most convenient and suitable; and, in too many instances, it is sawed into *boards* and that is all. Now, if a board four or five inches wide will subserve as good a purpose in building fence, as one seven or eight inches wide, there is a manifest want of economy in preparing the boards for fence; and if two posts will subserve as good a purpose for every sixteen feet in length of fence, as if they occupied only twelve feet, then there is a lack of economy in using up posts, and nails, and in digging the holes, and in performing most of the other work required to build a board fence. If the builder desires to build a *tight* board fence, *i. e.*, one with no spaces between the boards, it will require just about so many feet of boards for a rod, whether they are placed horizontally or vertically. But when an open board fence is to be erected, where economy in lumber and labor is a consideration of any account, the idea which should influence the builder is, to have the boards as long as will be most profitable, and as narrow as will be most consistent, with suitable strength and symmetry, and the spaces between the boards as wide as possible, and turn those animals which the fence is designed to stop, from getting on forbidden ground.

62. Many farmers, and experienced fence builders, also, have imbibed the notion, that the bottom board must, of necessity, be a foot or more wider than the others, and the second and third still narrower than the bottom board, until the top board is arrived at, which must be narrower than any of the others. We might, with the same propriety, contend that the bottom rails of a rail fence should be preposterously large, while the top ones should be the smallest. There would be just as much consistency in the latter as in the former. I know it is contended, that a board fence *looks better*, when the bottom board is about twice as wide as the top board. But we have all followed in the train of custom in this respect, for so long a time, that we have come to think, that a board fence looks "odd" and not tasty, if the boards are all of one width, being as narrow as would be consistent with their strength to turn animals. Had we been accustomed to see all the boards of a uniform width, it would appear still more odd, and deficient in taste, to see a fence built with the bottom board twice as wide as the top board. Sometimes the bottom boards are from twelve to to eighteen inches wide, and the top boards of the same fence only four inches. There can be no plausible reason whatever, to justify the use of such a wide board for the bottom of a board fence. It cannot be argued that greater strength is necessary near the bottom of a fence, for the reverse of this is true. Swine and sheep do not require as strong a fence as horses and horned cattle, consequently, if a wide board is necessary, matters of taste and strength argue, that it should be placed at the top of the fence, where the greatest resistence is needed. If a board four or five

inches wide possesses sufficient strength to turn horned cattle and horses, most assuredly, a board of that width is sufficiently strong to turn swine and sheep. If, for instance, a board was fourteen inches wide, and placed three inches from the ground, it would make the fence seventeen inches high. Now if that board were slit into three boards of equal width, being about four and a half inches wide, with the first three inches above the ground, and the first space three inches, and the second four inches, that same board would make a fence, $3+4\frac{1}{2}+4+4\frac{1}{2}+5+4\frac{1}{2}=25\frac{1}{2}$ inches high, and sufficiently strong to turn any kind of domestic animals. Again, fence boards are often sawed twelve or fourteen inches wide for the bottom board, the next nine inches wide, the next eight, the next seven, the next, or top, six inches. The spaces often are two inches below the bottom board; first space two inches, second space three inches, third space four inches, fourth space five inches, which will make a fence five feet high. The boards used would be equal to a board forty-four inches wide, with spaces amounting to sixteen inches wide. It is granted that such a fence would be a strong and substantial one; but, if the boards were all of a uniform width, (four and a half inches wide,) with wider spaces, but still sufficiently narrow to stop pigs and lambs, a fence five feet high, and far more tasty, in my own estimation, could be made with six boards, four and a half inches wide, equal to a board twenty-seven inches in width, with spaces three, four, five, six, seven, eight inches in width. But we would not be understood that we consider such a fence an economical one, or worthy of adoption, as a general rule, because, for ordinary purposes, all timber that is used in building a fence above four and a half feet high is useless; and the labor of building no better than thrown away. And, again, there is no necessity for having so narrow spaces between the boards. A space of four inches wide between the first and second boards at the bottom, is narrow enough; and any small animals, pigs or lambs, that will go under the bottom board, when it is four inches above the surface of the ground, or through a space five inches wide, above the bottom board, will seldom do any damage on the other side of the fence. An animal must be very small, to be able to pass through horizontal spaces, only four inches in width. Allowing, then, a space of four inches below the bottom board, and four inches between the first and second boards, when they are not less than four and a half inches wide, the space between the second and third boards may be five inches wide, without any danger of pigs or lambs passing through it; for any pig or lamb that can go through a five inch space, cannot, possibly, get through such a space, when it is seventeen inches above the ground, on which the animal is standing, *unless* it should be a descendant of the illustrious tribe of swine denominated "*land pikes*," or "*alligators*," or some mountain ranger of the sheep race. After a fence is built thirty inches high, if the spaces are just narrow enough to prevent cattle and horses from thrusting their heads between the boards, there will be no apprehensions that sheep will be able to get through them. There is no necessity whatever, in making any of the spaces, which may be alone two

feet from the surface of the ground, *less* than seven inches wide; for no sheep, nor swine, can get through a space of seven inches, when it is above two feet from the ground. And there should be no space more than ten inches wide, or eleven at the most. The upper space is often made one foot wide. But that is too wide; for horses and horned cattle, of many kinds, will thrust their heads through the fence, in a space of twelve inches. But in a space of ten inches, there is not room for the heads of ordinary cattle and horses. The builder, in building a board fence, can always calculate for himself, on the width of spaces. If cattle more than one year old, and horses, only, are to be fenced against, it will be entirely safe, unless animals are quite unruly, to make all the spaces ten inches wide. In fencing against calves, the spaces below thirty inches from the ground, should not be ten inches wide; because calves, and even most yearlings can thrust their heads through a space of ten inches.

63. We will now show by illustration what we consider a most *economical*, *substantial*, *symmetrical* and *tasty* board fence as can be erected, when there is no ridge of earth along the fence. We never consider a fence the most economical that can be built, when it is necessary to build a fence from the surface of the ground, that has not a ridge of earth below the boards, because a ridge of earth twenty or more inches high may be cast up at less than half the expense of purchasing other materials for fencing to such a height, making no account of the labor of putting them up. But as it is not always desirable, and sometimes very objectionable, to have a ridge of earth beneath a fence, we will calculate it from the surface of the ground. In all localities where animals of every description are allowed to roam lawlessly in the highway, a fence along the sides of the highway is usually required to be a little better than the ordinary fences of the farm. Along the highway it is often necessary to fence against all varieties of disorderly animals which belong to the dumb brutes of the fair creation, saying nothing of fencing against bipeds, which are most stupendously stupid, which run in the highways; and consequently a fence is needed which will offer a resistance fully adequate to the exigency of the circumstances.

64. A board which is sixteen feet long, four and a half inches wide, and not less than one inch in thickness, if it is of sound timber when made into fence, as it ought to be, will not give way beneath the weight of a heavy man when he is climbing over the fence, and it will resist a much greater lateral thrust than we would ordinarily suppose; and if the top board be covered with a cap board four inches wide, and an inch and a quarter thick, if of good timber, a horse or steer may mount on it and hang there until he becomes satisfied that his weight will not break the fence down; but the timber must be free from knots and curls, and places where the grain runs crossways of the boards. If a board four and a half inches wide will sustain such a weight and resist such a thrust as has been mentioned, it cannot be considered as the best economy to saw boards for fence over four and a half inches in width, and sixteen feet long; and it cannot be denied that boards of these dimensions are sawed up in the most economical manner for fences; but if the timber be full of knots and is "cross-grained,"

it would be more economical and wiser policy to saw some of them at least eight inches wide. With these considerations the builder will be able to determine with propriety what sizes, length, breadth and thickness will be

THE MOST ECONOMICAL DIMENSIONS OF FENCE BOARDS.

65. In order to save fence posts, the logs for boards should be cut sixteen feet long, besides the stub-shot. With this length the posts should be set just eight feet apart, from center to center. There can be no objection to cutting logs for fencing eighteen or twenty feet long; but with that length of boards it would be necessary to have more than two posts to each panel; for a distance of more than eight feet between posts, when the boards are only four and a half inches wide, would be rather too great; but if boards were sawed proportionally wider, and in no case should fence boards be sawed *less* than a plump inch in thickness, there could be no objection to cutting the logs eighteen or twenty feet long, and in setting the posts nine or ten feet apart. It would be far better policy to saw fence boards that are four and a half inches wide, one and one-eighth or one and one-fourth inches thick, instead of sawing them one inch or less in thickness. Fence boards, when not well painted, become thinner every year by the wearing away of the grain, caused by the influences of wet and dry weather, and consequently every board becomes less strong year by year.

66. Fig. 20 represents a style of board fence which will turn most effectually horses, horned cattle, sheep, lambs and swine, if they are not incorrigibly unruly, and which, in the judgment of our civil fence law, would be considered a lawful fence, either along the highway side or between adjoining farms. Some of our great sticklers for wide boards at the bottom, may take some exceptions to it, but if fields are all enclosed with such a fence, the proprietor and all the force of the farm may lie down to rest without entertaining any fears that any of their animals will get on forbidden ground through or over such a fence. It will be seen by the figure that it is fifty-three and a half inches high, including the cap board, and if that were one and a half inches thick, which would be economy, the fence would be four and a half feet high. The posts are set eight feet apart, from center to center, perpendicularly, (see setting posts, 96,) and a line struck on the sides of the posts for the top board, according to the manner shown at paragraph 96; and if but one workman is employed in building the fence, to aid in holding up the ends of the boards he will find it very advantageous to use two gauge boards, like fig. 21, which are very important in building a board fence, in order to prevent mistakes in the spaces. When two such boards are used, the lower ends can be set on the ground, and the top fastened near the top of a post, by driving in a nail a little, just sufficient to hold it while

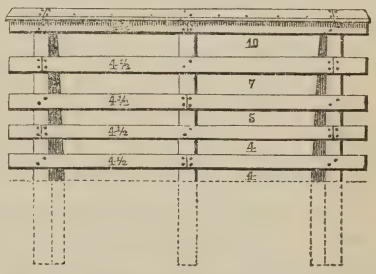


Fig. 20. Highway side board fence, four and a half feet high.

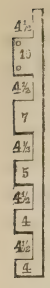


Fig. 21. Fence gauge.

all the boards of one pannel are being put up—two such boards would be of far more practical utility to a good workman than any two boys from the Emerald Isle, because the gauge boards would always hold them in the right place. The boards should "*break joint*" on every alternate post, because it renders a fence stronger than to have all the joints on one post. Not less than two eight-penny fence nails should be used in a place. The whole fence may be planed and painted, or not, as desired; but in either case, the face sides of the posts, and those parts of the boards which come in contact with the posts, should be painted or smeared with coal tar, to prevent their decaying. After the boards are all nailed on, the efficiency and strength of the fence will be much increased by nailing on battens, four inches wide, over the boards on each post. The insides of the battens and the fence boards where they are nailed, should be painted. Much care should be exercised in nailing on the battens, lest the large nails split the ends of the fence boards. If the nails are very large, holes should be bored through both battens and boards for them. Some fence makers consider it very important to fit pieces of boards in the spaces between all the boards, and nail them to the posts; but if a fence is well battened, and if the nails which hold the battens are driven near the lower edges of the fence boards, pieces in the spaces will not pay for the labor of fitting them and putting them in. After the battens are all nailed on, let the tops of posts be sawed off square, and the cap board firmly nailed on This should be four inches wide, so as to cover the top ends of the posts and the top board and the batten. If it should be desirable to case all the posts of such a fence, or every second post, the manner and style of doing it may be seen at fig 22.

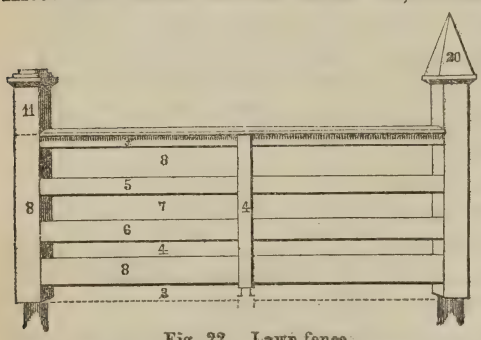


Fig. 22. Lawn fence,

67. Which represents a style of fence which is almost universally admired, especially by the farmers' wives. The fence is designed to be planed and painted, and a part or all of the posts cased. The face casings are eight inches wide, and extend ten or eleven inches above the top of the fence. The tops of cases are finished with square pieces of plank, or with a pyrimidal top, made of inch boards. The boards are all nailed on the posts, and then the face casings to posts are nailed on, as if they were battens. The side casings are then fitted by cutting gains in them for the fence boards, and they are nailed to the face casings. The side casings are six inches wide. This makes a case eight inches square. If every alternate post is cased, the remainder should be battened, as shown in the figure. There is no economy in casing posts, and it is done merely to please the fancy. For my own part I do not approve of casing but few posts, and I

may be allowed to say, that the majority of people are quite as well pleased with the appearance of such a fence when only the gate posts and those at the corners of the yard are cased, as when every post or every second post is cased. It increases the expense of a fence very much to case all the posts, and they are by no means ornaments of good taste and of rural beauty. For a fence which encircles a huge cathedral of the Corinthian style of architecture, cased posts for a board fence would seem to be in better taste and harmony than around a plain country residence of a farmer. The fence, as represented by figure 22, is forty-five inches high, including the cap board. There is one objection to it, however, and that is, it is not high enough to suit most men. But the eight-inch space might be made two inches wider, and the bottom board might be slit in two, and a space between the two pieces four inches wide. There is a width of boards, aside from the cap, in this fence, of twenty-two inches, and in figure 20 there is twenty-two and a half inches in width, but about a foot difference in the height of the fences. The builder can choose either, or reject both, or make the spaces a little wider or narrower to suit his caprice.

DIVISION FENCE.

68. Figure 23 represents a style of boards which almost every farmer likes, because of its *efficiency* and *cheapness* and *durability*. It is four and a half feet high, boards sixteen or more feet long, and four and a half inches wide, and only three to a panel. The spaces are the same as in the fence at figure 20. There are no cap boards, but battens are very essential. The great excellence of this fence consists in its permanence, and the facility with which it can be made. The posts are set as shown at figure 24, and any one can see at a glance that such a mode of setting posts will render a fence far more substantial, and much less liable to be made to lean either way by any influence which causes a fence to deviate from a perpendicular position. The boards of each panel are independent of each other; they may all be put up without any sawing off. In making a fence of this style all the posts at the ends of the boards should be set on a line with each other, and then the posts, at the middle of the boards, should be set about half an inch on the other side of the line. There is no face side to such a fence, both sides being alike, and there are no joints to make, nor to break, as in fences of other styles. After the boards are all nailed on, a ridge of earth, twenty-two inches high, should be cast up under the boards, and seeded with grass seed. As the grass seed sometimes all washes from the top of such a ridge, a row of sods should be laid on the top of it.

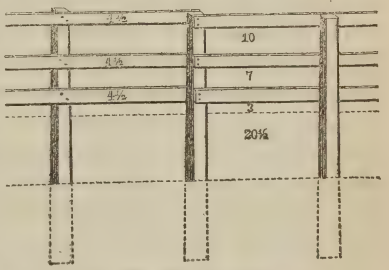


Fig. 23. Division Fence.

Fig. 24. Manner of setting fence posts for a Division Fence.

69. SELF-SUSTAINING BOARD FENCES

Are the most disagreeable nuisances that ever dishonored a farm. It is perfectly ridiculous to talk of making a good self-sustaining board fence that will bear any worthy comparison with a good post and board fence, either in point of cheapness or permanency. I have never seen a model of a self-sustaining board fence (unless it had as much worm, or even more, than a rail fence) which was fit for any other purpose than to entrap the credulous or to be kept in the museum. I am well aware that there are several styles of self-sustaining patent board fences, which have been extolled to the clouds, and which, at first sight, appear to be a great improvement in fencing; they look well, and seem to stand permanently, but after a few—yes, very few—years of exposure to the influences of the weather, they begin to twist and warp, and give way in important places by decaying or shrinking, so that they soon become as "shackling" as a rickety old wagon. When it becomes necessary to give much worm to a board fence, in order to save posts, any good arithmetician can show by figures in a few moments how many more feet of boards it will require to build a zigzag fence than a straight one, and it will be easy to show how many feet of boards will be used up in making locks and cleats, and such like, for the purpose of holding the fence erect; he can then calculate how much that redundant lumber is worth, which is required to build a zigzag board fence, over and above what is required to build a straight fence. After this, calculations may be made for posts, and the cost of posts for a straight fence, compared with the cost for a redundant quantity of lumber for a zigzag fence. A zigzag self-sustaining fence cannot be made without using up lumber of some kind for locks and cleats, nearly as many feet as there are in a post. And so with a straight fence; there must of necessity be about so many square feet of lumber for the standards and cross pieces and sills, or locks and stakes, as the case may be; and there is usually more or less waste in working up such material, and by close calculation it will in most instances equal the amount of lumber in the posts required for a panel. If self-sustaining fences would continue to be permanent for as many years as a post fence, there would be some good encouragement for adopting that style of fence, but the standards will shrink, and the locks will become loose, and if the cross pieces are not painted where they are joined together they will soon rot away, and the stakes, or pins, unless of the best of timber, and nearly as large as a fence post, will soon become loose and rotten, and the first heavy gale of wind will scatter the fragments as if it were a little boy's cob house. Patentees of self-sustaining fences will denounce me as a ninny for such words against their fences, but unless there shall a style of fence appear, which has never come under my observation, entirely different from any that is now in use, what has been penned will prove true to the letter in the experience of every one who may give such fences a fair trial. A good post and board fence is the fence for thrifty farmers, one that will stand firmly and erect without repairs for a score of years, one that will not crouch like a sneaking cur before a bullock when he

shakes his horns at it. When fence posts can be purchased for ten or twelve cents each, it will be the wisest policy and the cheapest, and infinitely better in the end, to make post and board fences, instead of being perplexed with such vexatious appendages as self-sustaining board fences.

70. But as there is such an insatiable thirst in many Americans, for new things, I deem it best to furnish some specimens of self-sustaining fence, and those who choose can adopt them in fence building, if they prefer either style to a post and board fence. There are a number of patents on self-sustaining, sig zag board fences, which, when they are *new* appear quite substantial and efficient, but, I consider them a poor apology for a fence. If a self-sustaining board fence is needed, of a zig zag style, the best way is to nail the boards to pieces of scantling, as long as the height of the fence, having the corner standards, to which one end of two panels is nailed, standing on a flat stone. But such a style of fence requires one-third more lumber than a straight fence, although it will be almost equal to a post fence in point of permanency and durability, and it will occupy a large space of ground, too much for an ordinary fence. It is poor economy to build a zig zag board fence. All self-sustaining fences, that I have ever seen, were very deficient in point of durability for a number of years. But there are several styles of board fence which are not exactly self-sustaining, although they pass under that name. For a permanent fence, let me have a good post and board fence, even when a self-sustaining fence can be made for about half the expense of it, and at the end of twenty-five or thirty years, if the expense is not in favor of the post and board fence I am no arithmatician.

71. It is very convenient, many times, to have what is called a surface fence, and in some localities where the soil is not deep enough to set fence posts on account of rocks, it is desirable to have some device, by means of which the standards of a fence may be kept erect. At figure 25 is a representation of a standard for board fence, which subserves a very good purpose for that object, and many prefer it to posts. *a a* are two standards, made of $1\frac{1}{4}$ inch lumber, about seven inches at bottom and three at top, with gains sawed in the edges for receiving the ends of the fence boards. *b* is a sill about three feet long, two inches thick and four inches wide. The two standards pass through the sill and are fastened with keys on the under side of it. Keys are preferable to pins, because, if the standards shrink a little they can be tightened a little with keys, but, with pins through the sills, they could not be tightened so readily. The tops of the standards are fastened with a band or small carriage bolt, after the boards are put in the gains. The ends of the sills are supported

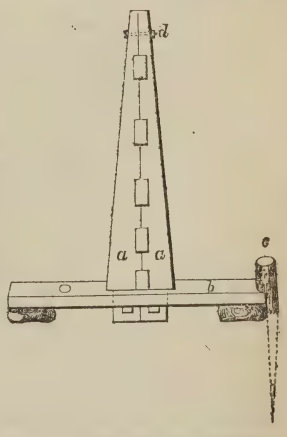


Fig. 25. Standard for Surface Board Fence.

by flat stones or blocks of wood, and kept in place by stakes well driven into the ground, as at *c*. The gains in every alternate standard may be just wide enough to receive the thickness of each board. Notches are sawed in one side of the boards to prevent their sliding endways. This style of fence is made without any nails, and it can all be made in the workshop, and carried to the field, and put up in a short period of time. If it is preferred, stakes can be driven through holes near the ends of the sills, for holding them in place.

72. Figure 26 represents a different style of standard. The sills may be about two by four inches square, with the standards passing through and keyed on the under side. Each side is braced with wires twisted together to hold it firm. When wire braces are used, and twisted up tightly, there is no need of keying or pinning the standard. The gains may be sawed in the standard about half an inch deep, and the boards nailed. Large flat stones may be used for sills, or the standards may be set on a rock and the bottom kept from moving, by drilling a half inch hole, one inch deep in the rock, and two inches deep in the bottom of the standard, and putting in a half inch iron dowel pin. Holes are drilled for the wire braces and made fast in the rocks by melted lead, and the wires, afterwards twisted together. Or a heavy stone may be placed on each end of a sill to keep the fence in the proper position ; but it will require nearly as much timber for the sills and standards as it would for posts, and it will require more labor to make the standards than it would to set the posts three feet deep.

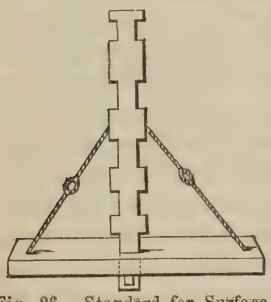


Fig. 26. Standard for Surface Board Fence.

73. Figure 27 represents Gabriel's patent portable board fence which appears to meet with much approbation by most farmers. *a a* are standards made of inch boards fastened to the top after the boards are put in the gains by a wooden yoke, or a little band of iron, *e*. *c c* is a horizontal strip of board about thirty inches long and five wide, and the standards may be nailed or screwed to it at the bottom. *b b* are two pieces of boards fitted neatly between the stakes *d d*, and the standards, and firmly nailed to the board *c c*. The stakes *d d* are one inch thick. Another board of the size of *c c* must be nailed on the opposite side of the standards. The standards may extend below the sills, as shown by the dotted lines, and the fence rest on these points, or the ends of the sills may rest on stones. The standards for this fence may all be made in

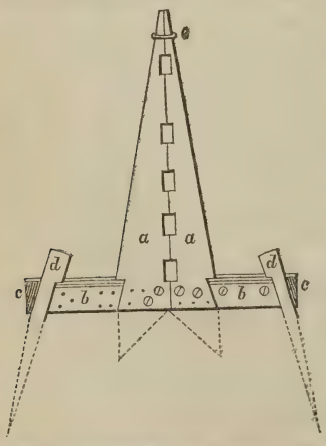


Fig. 27. Gabriel's Patent Portable Board Fence.

the workshop, but if the fence is to be set up where it deviates from one direct horizontal line the gains in the edges of the fence boards should not be made until the time when the fence is to be put up. In making such a fence up or down a hill, the standards should all be set perpendicularly and not at a right angle with the surface of the ground. Many farmers like a style of fence called

74. HALF WIRE AND HALF WOOD FENCE,

Or, a board and wire fence. The posts for such a fence may be set, as shown at figure 24, paragraph 68, and a top board and bottom board be nailed on above the ridge of earth, and two or three wires fastened on the posts, between these boards, with staples. Three wires between the bottom and top boards, when there is a ridge of earth along the fence, will turn sheep.

75. I have a fence four and a half feet high, thirty rods in length, with only a top sugar maple board, four inches wide, and three number eleven wires below it, with a ridge of earth twenty inches high, which has turned most effectually, ever since it was built, (four years since,) calves, cows, oxen, horses and colts, and they have never broke a wire although crops were always on the other side of it. I own a young bull which made many desperate efforts to get through it, without any success. The posts are eight feet apart, and the wire were never strained as they ought to have been, because it was my first experiment in using wire ; and I see no reason, at present, why that fence will not remain permanent, as it now is, for ten or fifteen years to come. I state this to show what three small wires and one narrow board have done.

76. Figure 28 represents a substantial barn-yard board fence. As such fences should always be tight, *i. e.* no spaces between the boards, on account of shielding animals from cold winds when they are not in their stalls, the best, neatest, and most economical manner of building them is, to set the posts three feet deep, and frame the rails, which should be of scantling, not less than three by three inches square, from post to post, as in building picket fence, and nail the boards to the *corners* instead of the sides of the rails. (See figure 37.) Such a fence should be about six feet high. In that case the top rail should be about four feet from the ground, and the bottom rail about twenty inches from the ground. It looks better and is better, all things considered, to allow the boards to extend nearly to the ground, instead of nailing on a bottom board, horizontally, below the vertical boards, as is often done ; and, more than all this, boards will not wear out as soon in the weather, when placed vertically, as when in a horizontal position. It is a good idea to place a row of flat

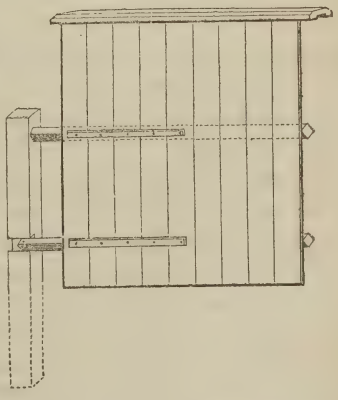


Fig. 28. Section of Barn-yard Fence.

stones under the bottom of the boards of such a fence in order to keep them dryer, by keeping away weeds and grass. After the boards are nailed on on the yard side of the fence, battens two inches wide, portions of which are shown, should be nailed over the boards, into each rail, with large nails. A line should then be struck at the tops of the boards, and all sawed off straight, and a *cap* nailed on the top of the boards, which is made of strips of two inch plank, two and a half or three inches wide, and two inches thick, with a groove half an inch deep, an inch wide on the under side of it, for receiving the tops of the boards. The corners of the cap are to be planed off before nailing on. This cap keeps the tops of boards dry and prevents their springing and warping in and out, and makes a fence much stronger, besides adding very greatly to its workmanlike appearance. If it is preferred to cut picket points in the top ends of the boards, it can be done most expeditiously by marking them all out with a pattern, and cutting them with a circular horse saw.

THE RIB FENCE.

77. Figure 29 represents a kind of fence which suits the fancy of some men better than any other style of fence. The posts are about five or six inches square, and three inch holes bored in the sides, two inches deep, for the ribs. The ribs are about two and a half inches square. They may enter the posts by mortise and tenon, although that style increases the labor of making it. The ribs, if square, should be put in as shown in the cut, with one corner upwards and one downwards, as they will make less space between them than if they were placed with a flat side up. The ribs should be about eight feet long, and with the corners cut off a little the ends will enter a three inch hole.

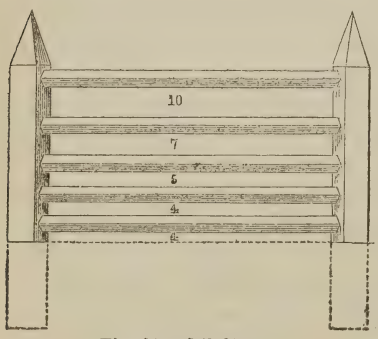


Fig. 29. Rib Fence.

78. By adjusting a three inch augur by the side of a railway horse power, so as to make about as many revolutions in a minute as the band wheel, with one horse, a man could bore a large lot of posts in a few hours. And as the ribs are put up when the posts are set, one workman would be able to put up a long string of it in a day. A line shonld be stretched, when setting the posts, parallel with the top rib, so that one panel will not pitch down nor slant up too much. When the ribs are put in place the ends should be well painted. This is a very economical and substantial fence, requiring no nails, no pins, nor wires. Should a rail or rib get broken at the middle of a fence, dig one post loose on one side of it, and lean it to one side of the fence, and put in a new rib, and then set it and fasten the post in its former erect position. Five ribs in that position will give a width of nearly eighteen inches, and the spaces thirty inches, which makes a fence four feet high; but the two lower ribs may be left out and a

ridge of earth thrown up in their place, which would be as effectual as a fence five feet high. A two inch round tenon at the ends of the ribs would be proportionally stronger than the middle of the same stick, eight or ten feet long, when of the size mentioned. Where the timber is all hard wood, it would be quite as economical to saw it into ribs $2\frac{1}{2}$ inches square, as into inch boards, and put them up with nails, because boards of hard wood are, sometimes, ugly and hard things to drive nails through without boring them for the nails.

WIRE FENCE.

79. The time has been, and it was but a few years ago too, when wire fences were considered by the great majority of people as an unwise experiment, which could never possibly be attended with success, and even in the last decade of years wire fences have been decried and condemned by many able correspondents of agricultural journals, which were sound on all the other ordinary subjects connected with the operations of the farm, and in some instances the editors themselves have imbibed the false inspiration, and have coincided with their respected correspondents in their views with regard to the certain failure of wire fences, and have denounced wire fence from beginning to end as an "exploded humbug." For many years wire fences were laughed at by almost every one who passed by, and every old fogy would wag his head and denounce the inventor, and builders also, as "incorrigible ninnies," and would utter all sorts of most direful prognostications against wire fence and everything else that resembled it.

80. It cannot be denied that there have been scores and hundreds of instances, in building wire fence, in which it would seem that the experiment was a most complete failure, and many farmers, who have ever entertained a very favorable opinion of wire fences, when they have come to see the report of those who have experimented (very superficially) in building such fence, "that wire fence could not be relied upon for protecting cultivated fields from unruly cattle," have been fully deterred from ever attempting to build a fence of wire, notwithstanding their own good judgment has always seemed to be in favor of such a fence, as a most complete success. If a substantial, permanent and impassable fence can be built of wire, what mean so many failures in building it? Why so many rods of worthless, inefficient obstruction between adjoining fields, denominated wire fence, which animals of all kinds pass and repass at pleasure? The reason is plain, and the remedy is very obvious and simple, and the failures may all be expressed in one short sentence—*imperfect construction.* Because one or two, or one hundred, individuals have failed in building an impassible wire fence, it affords no plausible reason why a most permanent and impassible fence may not be erected of the same materials. We have no hesitancy in affirming, that the failures have always been, without one single exception, attributable to imperfect construction, and not to any deficiency or imperfection of the materials used for such a purpose.

81. But fences of wire are no longer viewed as an object of doubtful

utility by men of enterprise and of practical common sense in building fences of any kind. Wire fences, with posts of durable wood or of iron, are among the most permanent, impassable, and economical fences which can be erected, especially in localities where materials, in the shape of stone or wood, cannot be obtained at a fair price. It argues a great destitution of the knowledge of the strength and efficiency of materials to admit, that a wire fence cannot be erected which will turn, most effectually, the most unruly animals that any one has no fears of giving their liberty in the open fields.

82. The chief difficulty, which has been almost invariably the cause of failure in the permanency of a wire fence, is the snapping of the wires by animals bounding along and plunging, when in full speed, against them. It is an unusual thing for wires which are destitute of flaws to be broken by the simple pushing and hooking of an animal. A bullock, or any other animal, will not thrust very powerfully with his nose or neck against a bare wire, consequently a small wire will resist effectually all the force that an animal is disposed to apply to it. But when an animal plunges against a wire with rapid fury something must give way, or he will be, perhaps, a little harmed by such an unceremonious rencounter. If we stretch up a lot of wires, and animals have nothing to admonish them that they are approaching an obstruction, when running at full speed, a wire fence is a dangerous obstruction to place in a field. When a wire fence is built thus it is very imperfectly constructed, and if the wires should be snapped asunder, or the fence completely demolished, or animals seriously injured, we need not be filled with wonder, because something of that nature would be only a natural and certain result. When a wire fence is erected in a proper manner, animals will very soon learn where it stands, and they will no sooner plunge against it than they will against a rail or a board fence. When a wire fence is built across a field where the ground is entirely smooth on both sides of it, and also where it stands, if the posts are some ten or twelve feet apart, and nothing but bare wires from post to post, colts and young cattle, when running, unless they have learned that there is an impassible obstruction along the line of posts, will be very liable to attempt to pass between the posts when running at full speed. But if a ridge of earth, from one to two feet high, be thrown up along the posts, or if a narrow board be nailed on the posts at the top, or even at the bottom, they will never plunge against it when running. It is always best to have a narrow board at the top of the posts, when it can be obtained readily, but in case boards are not at hand, a ridge of earth along the posts is a consideration of the first importance in building wire fences, because if animals do not see the wire they will see the ridge of earth, and will quickly learn that wires are above it.

WIRE.

83. Wire is obtained at the manufactory or at hardware stores in large coils; and sometimes the wire of a large coil will be several hundred feet in

length, and sometimes there will be a score or more of pieces in one coil. In purchasing wire for fences, the builder should see to it that the coils are not all *pieces* of wire, because it is much more convenient to make fences of long wire than it is of a lot of pieces, the ends of which must be firmly united before they can be used.

84. Wire for fences is usually annealed at the manufactory; but when it is not annealed before it is used, a whole coil or more may be thrown on a brush heap when it is burning, or a small fire may be kindled of wood for the purpose of heating it. Wire should not be thrown in a fire where it will become heated to a white heat, lest it becomes materially injured. All that is necessary is to place it in a gentle fire that will heat it all to redness, and then, by allowing it to remain in the fire until it has all burned down, and the wire becomes cool, it will be as pliable almost as lead, and very tenacious, and the ends may be twisted together without danger of breaking them.

85. The different sizes of fence wire are usually distinguished by numbers. The following fig. 30 will give a very correct idea of the diameter of the various sizes, from three to thirteen, which diminish regularly in size. No. 3 wire is exactly one-fourth of an inch in diameter; No. 6 is about three-sixteenths in diameter, and No. 11 is about one-eighth in diameter.

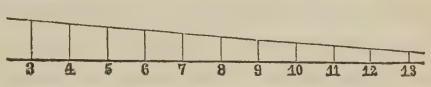


Fig. 30. Size of wires.

86. Fig. 31 represents the most common mode of uniting the ends of wires. In uniting the ends of large wires, it is advisable to have a small fire at hand in order to heat the ends when they are to be twisted. An iron kettle full of burning coals will subserve a good purpose. It is not always an easy job to unite the ends of large wire when they are cold, but by heating them to redness they may be bent very readily without danger of breaking them.

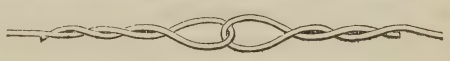


Fig. 31. Manner of uniting wires.

87. When a coil of wire is uncoiled, the coil should be rolled along like a hoop or hung on a reel until it is all uncoiled, because if it be uncoiled by allowing it to run off at the side, the wire will be twisted just as many times round as there are rings in the coil. And twisting wire very often produces a kink or a number of kinks in it, and causes it to break before it has been strained to half its proper tension for a fence. When wire is to be coiled up, instead of winding it around anything as we do a cord or a string, the coil should be rolled over and over like a hoop, in order to avoid twisting it, or wound up on a reel.

88. The most expeditious manner of separating a wire, either large or small, is to file a groove, with a triangular file, on two opposite sides, and if the wire be a large one, file entirely round it, and then bend it back and forth a few times when it will separate very readily. It is by no means an easy matter to break a piece of annealed wire simply by bending it back and forth, unless it is held firmly by two pairs of pincers or tongs.

89. Doubtless the beginner will often be in doubt as to the most proper size of wire for fences for ordinary purposes. One man will recommend No. 3, or 4, or 5, or some other number, as the most suitable; but he must exercise a little judgment of his own in this respect. As a general rule those farmers who have built wire fences, and have reported their success in the agricultural journals, have used wire twice or thrice as large as was necessary. Many have insisted on No. 3 and No. 4 as the only suitable size. There can be no disadvantage in using a large wire, but when a wire two-thirds smaller, which costs only two-thirds as much, will subserve the same purpose of a larger one, the small one is to be preferred before a large one. There is no propriety whatever in using No. 3 or No. 4 wire in building ordinary fences. Wire of such a size would hold to draw out all the posts, to which it might be attached, without breaking. Hitch a span of horses to one end, and let us see if by fair drawing they can separate it. By no means, if there are no flaws in it. There can be no consistency in using wire for fences which will resist three or four times as much as the posts to which they are attached. It is much better, and more economical also, to use a larger number of wires of a medium size, than to use a few very large ones. Wires should be strong enough to resist the force of the animals which it is designed to fence against. For fencing against small, peaceable animals like sheep, No. 12 or 13 wire is sufficiently large and strong; and for horned cattle and horses, No. 9 will turn anything that wears horns; and any animal that will thrust into a fence, when it is properly made, with force enough to break a sound No. 11 wire, should not have liberty in an open field.

90. The manner of fastening the wires to the posts is a very important consideration. Bending the wires around sharp corners of the posts should always be avoided, as wires are very liable to break when drawn tightly across a sharp corner. The ends of the wires may be fastened to the end post of the fence, by being passed entirely round it, after the corners have been rounded off a little; or they may be put through the post in a half inch hole, and the ends of two of them twisted together; or after the ends have been put through the post, they may be wrapped round a rod of wood, and the ends twisted around the same wire; or the ends, after having been put through the post, may be turned into holes in the post, and plugged up tightly with a hard wood plug. The wires may be fastened to the intermediate posts by driving staples over them, or by sawing gains in the sides of the posts for the wires, and nailing a strip of hard wood on every post to keep the wires in the gains or gashes. Strips one inch by two square is sufficiently large; but if the posts should be square, they should be about as wide as the posts. But the best way of fastening the wires, is to bore half inch holes through the posts for the wires, and, if thought best, pins of hard wood may be driven into each hole, which will hold them firmly. A little care and skill are necessary in boring the holes, in order to have them straight with the wires. If they should be bored crooked, or not in a line with the wires, the wires will bind on the sides of the holes with so

much force that it will be very difficult, in straining them, to bring them up to the desired tension.

91. A pair of pliers for holding the wires, and a pair of pincers for twisting it, are indispensable in putting up the wires, and a triangular file to aid in separating them.

92. Staples can be obtained at the hardware stores much cheaper than they can be made by hand. In driving them, if the posts are very hard, holes, a little smaller than the staples, should be bored in the posts, about half the length of the staples, otherwise the posts will be split or the staples "stove up" before they are half driven in, so as to hold the wire.

93. *The size of the posts* is another very important matter. It is not necessary to have posts for wire fence as large as they are for a board fence, providing they possess equal strength. One very common defect in wire fences has been posts that were too small. It is necessary to have posts which possess as much strength for a wire fence as for a board fence, otherwise a fence will be very deficient in fair proportion and symmetry. Many farmers have recommended posts for wire fence *only two inches square.* What a lack of common sense! Half a thrust by a heavy horse or ox, unless such posts were of the very best timber, would break off at the surface of the ground; and more than that, posts but two inches square are too small on the score of economy. It is true that the wood of a small post may not decay sooner than a large one, but allowing that they decay alike, when a half inch or more of the outside of a small post is gone, there will be but little remaining, whereas a half inch of the wood of a large post may decay and it will be injured but little. Intermediate posts for wire fence should never be smaller than three by four inches at the lower end, and one and a half by three inches at the upper end. But if they were one inch or more larger than this each way, they would last many years longer, provided they have been cut at the best season of the year for cutting timber, and seasoned a year or more previous to setting them in the ground.

THE PRINCIPAL MANIPULATIONS IN MAKING A WIRE FENCE.

94. Suppose, for example, we wish to make a wire fence thirty or forty rods, more or less, in length; let a stake be set at each end, and then set a dozen or more stakes in range with these, one or two feet high; plow a furrow where these stakes are standing as deep as practicable and straight as a line; by using a double team and a large plow, very much of the labor of digging the holes may be saved in a little time, by plowing a furrow twenty inches deep, or more (see Digging Post Holes, 162). Set the straining posts, figure 32, three and a half or four feet deep; they should be made of good timber, not less in size than three inches by six square, with two inch auger holes in one of them, and holes two inches square in the other. In order to have the holes correspond exactly with each other, the square holes should be made before the post is set, and after they are set the auger can be run through the square holes, in order to bore those in the opposite post. These posts should be set at least three inches apart.

95. The *strainers* are represented at *a*, which should be made of the most firm and tenacious wood, about one foot in length, with four inches of one end four-square, and the remainder turned round. The wires are put in a small hole through these strainers, and wound up with a wooden wench *b*, three feet long, fitted to the square end of the strainers. When the wires are sufficiently tight let the strainer be driven into the square hole and the wrench taken off. When a wire is to be loosened, drive the strainer a part of the way out, and let it unwind.

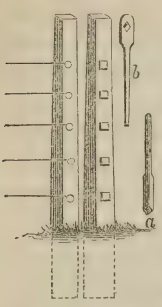


Fig. 32. A pair of Straining Posts.

96. Set an anchor post firmly at the other end of the fence. The anchor post and straining posts should never be more than forty rods apart. In making a long line of fence, straining posts should be set every forty rods, in which case they will answer for both anchor posts and straining posts. They should also be well braced. Let them be set perpendicularly on the work side. Set one post about six rods from the straining posts, perpendicularly, and then stretch two lines from this post to the straining posts, one at the top, and one near the bottom, and set the posts by these lines. By having two lines, a workman will be able to get the posts more in a line than when only one line is used, with the plumb rule (see fig. 91) to keep them perpendicular. When all the posts are set between the anchor post and straining posts, let the top wire be attached and strained in part, or nearly as tight as it can be. The aim of the workman now is to strike a line on the sides of the posts near the tops of them, which shall be parallel with the surface of the ground, were it even and smooth and free from depressions and little knolls. If the surface of the ground is level, there will be no difficulty in doing it; but when the surface is undulating it will require a little skill to do it in a workmanlike manner. Let the workman stand at the straining posts and look forward along the posts to a point where the ground begins to rise or descend. On the post which is nearest that point raise the wire or fence line as high on that post as it is at the straining posts, and support it with a nail. From this post cast the eye forward to the next point which deviates from a direct line, and support the line or wire on a post there with a nail. Let the top wire be adjusted after this manner throughout the entire length of the fence. Let the workman go back, and where the wire does not seem to be parallel with the surface of the ground, let it be adjusted by sticking a nail under it where it seems to need raising a little, and a nail or two above it where it seems to be a little too high. Figure 33 will give the builder some correct ideas on the subject, by which the top wire or line is properly adjusted, parallel with the general surface of the ground. Sharp angles in the rising and falling of the fence, as shown at *a b* of the

Fig. 33.

preceding figure, should be avoided as much as practicable. After the top wire or line is adjusted as correctly as may be, let the workman stand away from it three or four rods, and walk the whole length of the fence at that distance from it, and if it appears all right, the next operation will be to mark off the distances on the sides of the posts, by means of a board six or eight inches wide, with notches made in it, like fig. 34, as far apart as the holes are to be bored, or the wires to be fastened. The upper notch of the marking board should be placed even with the top wire, and then there will be no liability to mark some posts wrong.

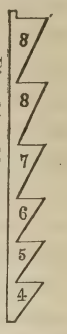


Fig. 34. Marking board.

97. Let the holes be bored with a good auger bitt, instead of an auger, as a man can bore more than twice as fast with a bitt as with a small auger, and with much less fatigue. When the holes are bored the wires, may be put in and fastened at one end, and drawn up as tightly by hand as they can be, and then attached to the strainers, (see fig. 32.) It is a good practice to hitch a horse to one end of the wires and draw them up as tightly as practicable before attaching them to the strainers. When it is necessary to unite a wire where it is in two parts, the junction should be midway between two posts, lest it should be too large to go through the hole in the post. If the wires are to be fastened with staples, the staples should all be driven almost in before

STRAINING THE WIRES.

98. Let the ends of the wires be firmly secured in the strainers, after having greased them with a little lard, to make them turn easily, and draw them up as tight as possible without breaking the wrench or the strainers. About ten or fifteen rods from the straining posts let a man step on the wires, and spring up and down on them, and if they stretch any let them be drawn up tighter. In warm weather the wires should be drawn up tight, as they expand in warm weather and contract in cold weather about one inch in a hundred feet. As the cold weather comes on the wires may be loosened a little as there is some danger of their breaking by their tendency to contract. There is but little danger, however, of their breaking by contracting.

99. When wires pass through the posts, some fence makers prefer to drive a pin into each hole to keep the wires from rendering when any thing presses against them, and when they are fastened by staples some prefer to drive the staples tight on the wires. The most advisable way, probably, is to fasten the wires at posts nearly a hundred feet apart, and then, if it is necessary to loosen or tighten them, it can be done at less expense than if they were fastened to every post.

100. The top board (See figure 34,) may now be nailed on, and if desirable, the tops of the posts may be sawed off and a cap board put on. Or, what would be still less work, let a scantling about three by three inches square be firmly nailed on the tops of the posts. It will add very much to the durability of both wires and boards to have them well painted with

paint or coal tar, especially where they touch the posts and where the wires pass through the posts. By using a very small brush, paint can be worked into the holes on each side of the posts.

101. When posts are more than eight or ten feet apart stay wires may be used to prevent an animal from thrusting his head between the wires of the fence. For this purpose number twelve wire is sufficiently large, but should be well annealed before it is used. It is attached, first, to the top or bottom wire of the fence, by wrapping one end two or three times around it, and then by passing once around each of the other wires, being careful to keep them at their proper distance apart.

102. The final operation now will be to cast up a ridge of earth along the fence, twenty or more inches high, and seed it with grass seed. A wire fence should seldom be made without such a ridge.

103. Another mode of building wire fence where posts of wood are scarce and iron and stone abundant, is, to use *iron* posts and *stone* sills for the intermediate posts. Figure 35 represents an iron post, which is made of wrought iron, about three-eighths of an inch thick at the lower end and three-sixteenths thick at top, and three quarters *wide* at top, and inch and a half *wide* at bottom, with shoulder on each side of the tenon, which is passed through the sill and fastened with a key or nut and screw. A shoulder one fourth of an inch deep on each side is sufficient, and the tenon may be tapered from the shoulder to the lower end of it, when a nut is used to fasten the posts; but an iron key is the best and cheapest in the end of tenon, and is, usually, more convenient. The best way to obtain such posts would be to give the dimensions of them to the proprietor of some manufactory of iron and have them rolled out, and holes punched for wires and keys, where machinery for such purposes is used, and then the expense of them would be but one cent or so on a pound more than for ordinary bars of iron. The sills may be made of almost any kind of stone. A sill six inches wide and four thick, and three feet in length, is a good size. Stone for flagging, which are not more than two inches thick, may be used for that purpose, providing they are not less than three feet long and eighteen or twenty inches wide. Bolders and blocks of square stone, weighing several hundred pounds each, may be used by drilling holes in them three or four inches deep, and by placing the iron tenon in the hole, and by pouring in melted lead to make it solid. Such posts may also be fastened into blocks of wood or into plugs of wood driven into the ground as deep as for fence posts.

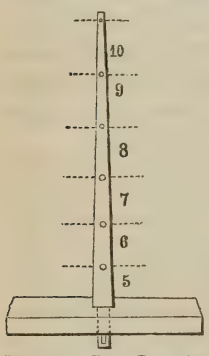


Fig. 35. Iron Post for Wire Fence.

104. In making a wire fence with iron posts inserted in sills of stone, it is best to form a ridge of earth where the fence is to stand, about twenty inches high, and three feet wide on the top, and seed it with grass seed and allow it to settle one season and then place the sills in which the iron posts have been set, on the *surface* of the ridge, in a line with each other, as in

setting posts of wood. Bolders, into which posts have been set, may be sunk a few inches into the ridge in order to make the holes in the posts stand in a range with each other. Posts set in this manner may seem to some people like a very superficial fabric, possessing little permanency, but after such posts have been placed a few weeks let a man move them if he can, by taking hold of the iron posts, Such posts may be placed thirty feet apart on the ridge, and two or three stay wires put on the main wires, between the posts. In order to prevent swine from lifting the bottom wire, the stay wires may be first fastened to the stakes driven into the ridge and then passed around the other wires to the top wire. After the wires have been put in and strained the holes may be plugged with hard wood to keep them from rendering back and forth when the wires are pressed sideways. A fence made after this plan will remain permanent, without doubt, as long as one man usually wants a fence. If the posts should ever become a little inclined they may be readily set erect by raising one end of the sills.

105. THE NUMBER OF WIRES in a fence will always depend upon the size of the animals to be turned by the fence. No sheep, cattle, or swine of a hundred pounds weight, will be able to pass between the wires of a fence like figure 36, when the wires are well strained. In merely fencing against horned cattle and horses, there is no necessity of having any of the wires less than eight or ten inches apart, and they should never be more than ten inches apart. The bottom wires which are designed to turn sheep and swine, may be no larger than number twelve or thirteen, as no sheep nor swine will be able to break a wire of that size. The strongest wires should always be placed about as high as the shoulders of horned cattle and horses.

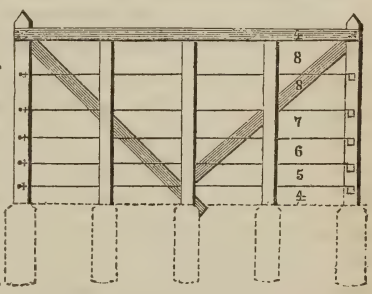


Fig. 36. Section of Wire Fence.

106. There are several modes of straining the wires of a fence besides the one noticed in paragraph 94, but for convenience, cheapness, efficiency and practicability, they are inferior to this. Straining wires by having a small iron screw and swivel in each wire, is a good way, but is usually too expensive. There are modes of having all the wires pass through holes in an upright roller, and then with an iron lever the roller is turned round and the wires are strained from the ends of a fence towards the middle of the fence, by being wound up on the roller from each way. But this is a very inefficient manner of straining wires, and he who adopts it will be glad to abandon it before he has been able to bring all the wires to a uniform tension. There are several other very neat modes of fastening wires to the posts, but some are too expensive and others are not worthy of adopting.

PICKET FENCE.

107. There are, probably, a larger number of different styles of picket fence than of any other variety of fence, and the most fastidious can always find some style, among so great a variety, that will harmonize with his taste and fancy. There is greater adaptedness in picket fences to many purposes than in any other kind of fence, and in some instances picket fence will subserve a purpose which could not, practically, be accomplished with any other kind of fence. As picket fences may be built of so many different styles, he who aims to erect a picket fence which shall be in good taste and harmony with his grounds and buildings, if he knows exactly what he most desires, is not compelled to search a great length of time to find a style of fence which will come fully up to his ideas of what a picket fence should be. There is an appearance in picket fence which almost always affects surrounding objects more or less, and not unfrequently a picket fence of correct style, to harmonize with surrounding objects, imparts a beauty to the scenery which a board fence, of the neatest style, or a stone fence or hedge fence would never impart. Picket fences have all the excellences which can possibly be combined in any style of fence; they may be strong or fragile, costly or cheap, neat and tasty or awkward and homely, or ornamental or plain to any desirable degree. No style of fence, in my own estimation, adds more to the beauty of spacious door yard, or lawn, than a tasty picket fence. Although a board fence may be made as ornamental and tasty as such materials will admit of, still a picket fence seems never to fail to satisfy the caprice of the most fanciful.

108. There is, also, an efficiency in many kinds of picket fence, which no other kind of fence possesses. A picket fence will not only stop fowls from roaming on forbidden ground, but will, often, be the means of keeping the productions of the fruit yard and garden in safety, from pilfering interlopers, who would climb over a board fence, and carry off, without difficulty, the delicious booty. A picket fence is, usually, a difficult, dangerous fence to climb over; and for this reason, when orchards and fruit yards and gardens have been encircled with a substantial picket fence, the proprietors have feasted on their own fruit and vegetables, which they would never have tasted, had their grounds been enclosed by any other kind of fence. When a fruit pilferer is passing a fruit yard, which is enclosed with a board fence, as he can hop over at any place, he is sure to glut his swinish palate with anything within his sight; whereas, had there been a picket fence, he would have passed on, and found his booty somewhere else. Horses, horned cattle, and almost every other kind of animals, fowls, and other bipeds, which belong to a higher order of creatures not excepted, which need to be fenced against, are usually more shy of a picket fence, than of any other style of fence. Dogs will, many times, run many rods around a picket fence, rather than jump over it; when, if a board fence, of the same height were there, they would have bounded over it, without any hesitancy. This is, particularly, the case, if the tops of the pickets are pointed. Fowls, in flying over a picket fence, generally aim to perch on the top of the pickets, as they are accustomed to do on other

fences; but, as pointed pickets are not very convenient for them to stand upon, they soon learn, that it is best to fly over, without touching it, which they seldom do, or keep on their own side of it. Filching marauders, in quest of good fruit, fear the points of pickets, lest they, by an inadvertent hold, or step, should meet with their merited deserts.

109. In point of economy, in dollars and cents, a picket fence may cost more than a board fence, or it may not cost as much. The height of each fence being the same, there will be little, if any difference in the cost of the rough materials; but, the labor of building, according to a given style, will increase, or diminish that cost, according to the amount of labor bestowed upon it. The style of casing and capping the posts, or not casing them; the style of rails and bottom boards; and the style of the tops of the pickets all affect the expense of a fence, in proportion to the amount of labor required in dressing out, and preparing the materials. There is often an unnecessary amount of labor expended in making the tops of pickets very ornamental, by cutting them of different forms, which only increases the expense, without adding at all to its beauty or efficiency. The plainer the work is, in making a picket fence, and the less cut work, in the shape of gains and moldings there is about it, the neater it appears.

110. *The width of pickets*, and the width of *spaces between them*, is a consideration which affects the symmetry and expense of a fence, far more than most people are wont to suppose. Pickets are often made one-third, or two-thirds wider than is necessary for strength, to say nothing for or against their beauty; and the spaces between them are too frequently twice, or thrice as narrow as they might be, without detracting at all from the efficiency of the fence, or from its real beauty. Pickets are often four inches wide, and the space between them but two inches; in which case, a width of pickets eight inches wide is required for every foot in length of a fence. But if the pickets were two inches wide, which is sufficiently wide for ordinary fences, with two-inch spaces, there will be a saving of just one quarter of the lumber for the pickets required for a rod in length. But, when pickets are a plump inch thick, and not more than four feet long, a fence will look quite as well, when the pickets are one and a half inches wide, with spaces two and a half, or three inches in width. It is a thing of rare occurrence, that pickets of the size last mentioned, are ever broken by animals thrusting against them, or by attempting to pass them in any way. When pickets are inch and a half wide, and the spaces between them two and a half wide, only a width of four and a half inches of pickets is required for a foot in length of fence. Spaces two and a half inches wide are narrow enough to stop any kind of fowls, or pigs and lambs.

111. Figure 37 represents a neat, cheap, durable and substantial lawn fence, and may be three and a half to four and a half feet high, to suit the fancy. The top of the pickets should extend not less than eight inches above the top rail, and if the fence is four feet, or more, in height, they should extend not less than ten inches above the rail. The rails should be about three inches square, in which case the posts may be twelve feet apart, and should be fitted to the posts as shown in the figure, so that the

pickets may be nailed to a corner of the rails instead of aside. Rails are much stronger, both laterally and vertically, when placed in this position, than when they are placed with one side up. And, besides this, the

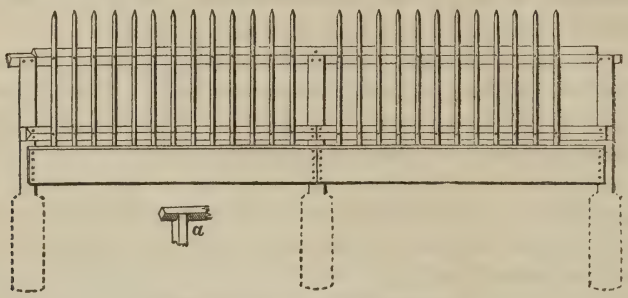


Fig. 37. A Lawn Picket Fence,

surface of conjunction between the pickets and rails is so small, that there is little or no liability to decay, as is the case when pickets are nailed to the flat sides of rails. Every one who has had any experience in picket fence, knows that when pickets are nailed to the flat side of rails, water will often get between them, and cause them to decay, in that place, in a few years. The bottom rail may be halved, and let into gains in the posts, or attached by mortises and tenons; and the strongest mode of putting up the top rail (unless by mortises and tenons) is in sawing off the tops of the posts, to saw from each side of the posts, with cut slanting downwards, so that the top rail will fit the cut neatly, as shown at *a* in figure. The top rails may then be nailed, as shown at the top of the posts. Where the rails and posts touch each other they should be painted to preserve them from decay.

112. The pickets may be sawed out of inch boards with a power circular saw, as it is difficult to saw pickets of so small a size from logs, at the saw mill. After they are dressed out, the tops may be sawed off in a miter box, with a hand saw, or with a small circular saw. In nailing them on the rails, let a chalk line be stretched as high above the rails as the tops of the pickets are to extend, supporting it in the middle, if it sags a little, with a picket, slightly tacked to the rails. Dress out a space board, as wide as the spaces, and be particular to have both ends of an exact width. Drive a long nail in one side of it, near the top, so that it can be hung on the top rail; now nail on the first picket, and plumb the edge on one side. Hang on the space board, and put up another picket to the side of the space board, with the top barely to the line, and hold it with one knee, while nailing it. After two or three pickets more have been put up, apply the plumb rule (see fig. 91), and see if the pickets are perpendicular. After the pickets are all nailed on, the bottom board, the top edge of which is planed beveling, as shown in the figure, may be nailed on, on the outside of the pickets. The lower ends of the pickets need not be sawed off even, as they are not in sight, and the bottom board may be nailed to the lower rail, subserving the additional purpose of a batten or ribbon, or it may be two or three inches below the rail. A ribbon, about one inch by inch and

one-fourth square, may be nailed on the pickets, into the upper rail. But, if each picket is nailed with two sixpenny nails, to each rail—four nails in a picket—if the rails are of hard wood, a ribbon will be of little utility. A half round ribbon would look better than a square one. Near the middle of the bottom boards, a few pickets may extend to the bottom of the board, on the inside, and be nailed to it to strengthen it. The bottom board may be from eight to ten inches wide; or there may be two narrow boards, four and a half or five inches wide, with a three or four inch space between them, which is in quite as good keeping with a picket fence, as one wide board. If it is desirable, the posts of such fence may be cased. But, if the gate posts, and posts at the corners of the yard be cased, like those at figure 22, the fence will, probably, suit the majority of people quite as well as if every post were cased.

SELF-SUSTAINING PICKET FENCE.

113. Fig. 38 represents a style of fence but little different from the one shown at fig. 37. The pickets, bottom boards, rails and ribbons are all alike, but instead of posts, standards are used, one of which is shown at fig. 39. The sills, *a*, are made of scantling not less than three by four inches square, and thirty inches or more long; and the standards, *b*, after the mortises have been made for the rails and bottom boards, are firmly united by mortises and tenon to the sills. Braces, *c c*, are then nailed on, or wires twisted together, as at fig. 26. The standards may be of one and a half or two inch plank, and may extend above tops of pickets, for holding one or two wires, to prevent fowls from flying over it; or they may extend no higher than the tops of the pickets. If prefered, the standards may be in two parts, like fig. 25 or 27. The ends of the rails are halved together at the standards. The longer the rails and bottom boards are, the less will be the expense for the labor of building, as they may be run through one or two standards without having a joint at each one. When they are made in two parts, like fig 25, instead of fastening the tops with bolts or bands, a wooden yoke, made of two-inch plank, with a long mortise in it, is fitted to the standards, about half way from the tops of pickets to tops of standards. The ends and sides of the yokes are rounded a little, and give a very tasty appearance to a fence. The sills may be staked to the ground, or large stones laid on them, to keep them from being moved; or it will stand very firmly itself. But if fence posts of cedar or yellow locust, or of some other durable timber, can be obtained for twelve or fifteen cents apiece, it will be the most economical in the end to build a fence like

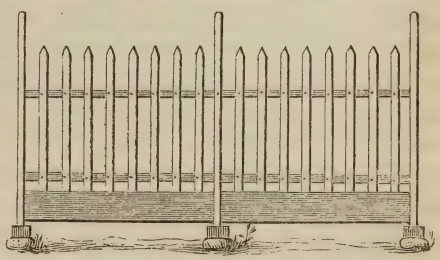


Fig. 38. Self-sustaining picket fence.

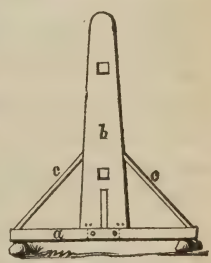


Fig. 39. Standard for self sustaining picket fence.

fig. 37, with posts, instead of a self-sustaining fence, like fig. 38, unless a portable fence were desired.

SELF-SUSTAINING PORTABLE, ZIG-ZAG, PATENT PICKET FENCE, OR HURDLES.

114. Fig. 40 shows a style of picket fence which was secured by letters patent in 1858, and which appears to take well where it is introduced. The rails are about twelve feet long and two inches square, of hard timber, and the pickets are two inches wide, pointed or not, with spaces to suit the builders. Each picket is nailed on with four nails, and the ends of rails are fastened together by pins of wood or iron, which are driven through two of them. The panels are all made in the shop, and care is taken to have the pickets nailed on at a right angle with the rails. The holes at the ends of the rails are bored straight through, in order to correspond with each other. If the pins are of iron, a rod three-eighths of an inch in diameter is large enough, or a three-quarter wooden pin. The panels are set up in a zig-zag manner, with a worm of three or four feet with flat stones under the corners, and if it does not warp and twist, and settle off sideways in a few years, or if the wind does not turn it topsy-turvy, and inside outwards, it will stand firmly until it rots down where it was set up. In the event of a hurricane, stakes might be driven in the ground at each corner, and the fence wired to them. It is a very good design for hurdles. When such a fence is made up and down hills, there should be a brace nailed from one rail to the other, to keep the panels in their proper shape.

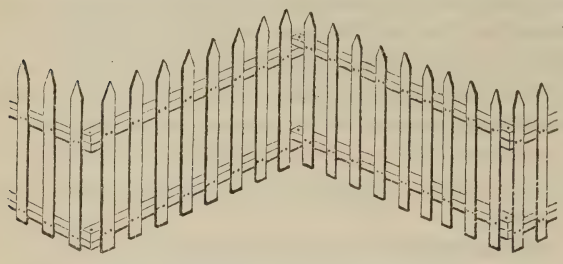


Fig. 40. Self-sustaining portable picket fence or hurdles

POULTRY YARD FENCE.

115. Fig. 41 represents a very good style of picket fence for enclosing the kitchen garden or poultry yard. It may be built of any desirable height. It is best usually to have a bottom board, nine or ten inches wide, close to ground, or a little ridge of earth may be thrown up under it, to keep chickens and ducklings, and such like, within the enclosure, and to exclude skunks and other "varmints" from the yard during the night. There is no necessity whatever in building such a fence more than six feet

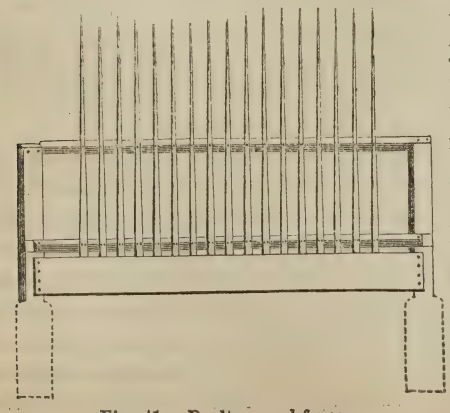


Fig. 41. Poultry yard fence.

high. Our domestic fowls do not need wings any more than they need fins, and if they are disposed to fly over the top of such a fence, let two or three inches of the end of one wing be clipped off, and they will soon make no effort to fly. The pickets for such a fence should be sawed tapering, as shown in the cut, about two and a half inches wide at the lower end, and not more than half an inch wide at the upper end; the space board (sec. 112), about two inches wide at the lower end, as a space of two inches is narrow enough, and the upper end must be enough wider than the lower end to correspond with the taper of the pickets. The space board need not be as long as the pickets. The object of sawing them tapering, is to save lumber, as the spaces can be much wider at the top than at the bottom of the pickets. It is always best, when it is not inconvenient, to nail on the pickets on the inside of the yard, so that fowls cannot fly on the top rail, and then fly over, or get through between the pickets.

THE FIELD, WIRE AND PICKET FENCE.

116. Is usually made of pickets turned round and pointed, although square ones are frequently used instead of round ones; but they are not as neat, especially if the fence is to be painted, because the loops of wire in straining cut in the corners of the pickets much deeper than they do in round pickets. The pickets are cut out in a lathe in the same manner that broom handles and rake stales are cut out, and the ends are thrust into an instrument called a pointer, holding cutters, which will sharpen the end of picket in a second or two. They are from four to five feet long, and an inch or more in diameter. One inch in diameter is rather too small for a fence where cattle and horses run. Instead of wooden rails for holding the pickets, two wires are used, bent into loops, like fig. 42, which represents a wire about the size of No. 10 or 11, ready for the pickets. It is very important that the loops be bent with as much uniformity as possible; because if both the upper and the lower wires are not bent into loops as nearly alike as they can be conveniently, the pickets will not all stand in a perpendicular position. I have noticed fences made in this manner, where the pickets in some parts of the fence would lean more than the width of one space.

Fig. 42. Manner of bending the wire rails for a picket fence.

117. To aid the workman in making the loops, an instrument like fig. 43 is necessary, which is made of cast-iron, and screwed fast to a work bench, or held in a vice. The projections, *a a*, should be as large in diameter as the pickets, and just as far apart as it is desirable to have the pickets when they are worked into the fence. In forming the loops, have the wire in a close coil, and after winding it around one of the iron pins, *a a*, carry it to the other pin, winding the wire around that also. Now slip both loops off the tops of pins *a a*, and put the loop which was made last on the first pin. Again slip off the loops and carry them back, making one loop every time they are slipped off. Great care should be ex-

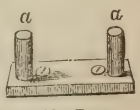


Fig. 43. Instrument for bending the wire.

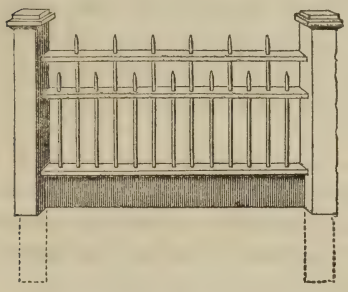
ercised to carry the coil, in bending every loop, just so far forward, and to have the last loop put on the pin with the straight part of the wire between the loops at just such an angle with the pins, otherwise there will be a variation in the spaces, so that the pickets will lean a little in some places, and then will be perpendicular in some places, and then they will lean a little in other places in an opposite direction. An accurate workman will bend the loops with two pins, but the beginner had better have three pins instead of two, and then there will be no liability to make variations in the spaces. When three pins are used, all three of the loops must be slipped off the ends of them every time a loop is made. The wire should not be wound around as a string would be, but the whole coil must be carried around the pin. If this is not done, the wire will be *twisted* once around at every loop, which weakens its strength.

118. The posts for such a fence may be set as far apart as thought best, say from eight to twelve feet, with one side of them on a line with each other; and then the wires may be laid on the ground, and the pickets put in the loops, with the tops all in line. When the ground is level, after the pickets have all been put in the loops, they may all be set up, and the wires strained, (see fig. 32,) and fastened to each post, with staples driven over the wires, into each post. Where the ground is undulating, it is a most difficult job to adjust the wires in such a manner, that the pickets, up and down slopes, will all stand in a perpendicular position. Suppose, for instance, a fence is to be made fifteen or twenty rods on a level, and then to rise up a slope, from ten to twenty rods. Let the wires be fastened to the post at the bottom of the slope of ground, and have a set of straining posts at the top of the slope, and another set at the end of that part of the fence on level ground; and let the wires be strained from both ways. If either of the wires should seem to be looser than the other, and straining it more would incline the pickets from a perpendicular position, it would be best for a man to step on the wire which is the *tightest*, in several places, in order to bury the wires deeper into the wood, and then they can both be strained up to the desired tension

119. The cost of such a fence will be easily estimated, and very quickly made. The pickets, in this region, can be obtained, turned and pointed, for one dollar per hundred, four feet long. If they are one and a quarter inches in diameter, which is as small as they ever ought to be, with four inch spaces, it will require about thirty-seven pickets for one rod of fence. The cost of the wire will depend on its size; and the cost of posts will depend on the locality, and the kind of posts used. Posts similar to fig. 35, may be used for this style of fence, by passing a wire around the wire which holds the pickets, and through the holes in the post, and twisting it up tight. Instead of having the pickets four or more feet long, a ridge of earth two feet or so high may be cast up, and the pickets be made correspondingly shorter, which will lessen the cash cost, and at the same time, increase the efficiency of the fence, by means of the ridge of earth. When such a fence is put up in a workmanlike manner, and well

painted, it harmonizes with the taste of many individuals, better than almost any other style of fence.

120. Fig. 44 represents one of the most expensive kinds of picket fence which can be built; but which harmonizes quite well with the style of architecture of the buildings which it surrounds. The pickets are turned round and pointed, and every alternate one passes through three rails. The rails should be bored with precision, and with an auger, or bit that will cut a clean, smooth hole, so that the pickets will fit water-tight. If they are painted, there will be no danger of their rotting in the rails on account of the rain getting in.



Ornamental Round Picket Fence.

121. In making this or any other style of picket fence up a slope, the rails for one panel must be fastened in the position of inclination, in which they are to be placed, when the fence is built, and then, with the plumb rule, make a perpendicular mark on the edges of the rails; after which, it will be easy to adjust the table on which the rails are laid, when they are bored, in order to have the holes of the desired angle. When the fence is built on level ground, the holes for the pickets must be bored through the rails at a right angle; but, if bored at a right angle, when the fence is not on a level, the pickets will all lean, in proportion to the steepness of the slope, which would look awkward and very unworkmanlike. I should not have mentioned these particulars, had I not seen fences which were made by inexperienced workmen, with the pickets leaning down the slope, at about a right angle with the surface of the ground. A modification of this style of

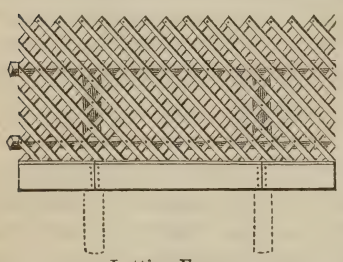
AN ORNAMENTAL LAWN FENCE.

122. A fine specimen of which may be seen encircling the grounds of Mr. Andrus, of Ithaca, is made with turned posts with acorn tops, and turned pickets with acorn tops, with two rails through which the pickets pass, and a bottom board from eight to twelve inches wide. The fence last mentioned, is about the neatest fence which I ever have seen for a lawn fence, and as durable as the wood of which it is made. The acorn tops are turned in a lathe, with gouge and chisel, after the other part has been cut out straight. When it is desired to make the posts ornamental by turning them—as turned posts are much cheaper than the casing of posts—a very efficient lathe may be fitted up for the purpose, without a mandrel, by having a point instead of a mandrel, at one end of the lathe, with a screw and point at the other end, and allowing the band from the speed wheel of the driving power, to pass round the post instead of a pully, on the mandrel. Or the posts might be mounted with a large wooden acorn, whether they were cased or not, or with any other ornament turned out of wood. But a turned post would be in better keeping with the pickets,

than a a square one; and a man who understands turning, would turn out three posts sooner than he could case one. As we cannot drive such pickets in the rails, they should be just large enough to fill the holes, and so that they can be worked in by hand, without driving them. The pickets should be thoroughly seasoned; but the rails through which they pass, may be green or half seasoned; because, when they shrink, they will hold the pickets tighter than when they have been seasoned, before boring the holes.

AN ORNAMENTAL LATTICE FENCE.

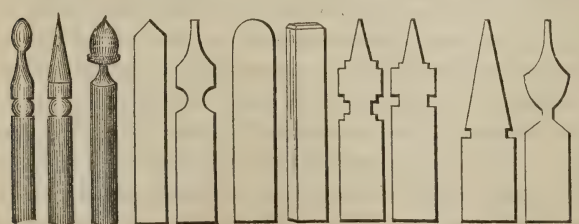
123. Is shown at fig. 45, which is often built between the gardens of adjoining owners, or on the back side of lawns or gardens. The rails and posts are put up in the same manner, as for ordinary picket fence, with bottom board or not, as preferred; and the lattice is made of half inch stuff, inch and a half or two inches wide, put up at a right angle to each other, or at an angle that will make the meshes, or open spaces of a rhomboidal form, as shown in the illustration. The spaces may be of the width of the lattice strips, or from three to four inches wide. The tops of them should be screwed together, instead of nailing them, as screws will hold much better than nails. In putting on the strips, they should be kept at just such an angle; and the surfaces of conjunction, between the two courses of lattice ought to be painted, before the second course is nailed on.



Lattice Fence.

124. THE FORMS OF PICKET TOPS

Are as numerous as the different styles of fence, and may be varied to suit the taste of the most fastidious. Many men like the plainest form possible for picket tops, and others, again, think a fence very incomplete, and tasteless, without ornamental tops of some style. The style of architecture in which the buildings are finished, should determine, in a measure, the style of picket tops, for the fence which encircles them. Figure 46, 47, 48, represent turned pickets, and are particularly adapted to rural residences, with spacious door-yards, or lawns, beautifully embellished with a variety of shrubs and evergreens. The top of figure 46 is turned in the shape of an egg. The top of figure 47 is of any oblong conical form. Figure 48 is of the form of an acorn. If it were desirable to have the acorns larger than the main parts of the pickets, they might be turned separately, and a half inch hole bored in the lower ends of the acorns, and tenons made on the upper ends of the



46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56,

Forms of Tops of Pickets.

pickets, and paint. The tenons can be cut with a tenon augur, fitted to the mandrel of a lathe, and the acorns bored in a lathe, so that the expense of fitting them up in this manner would be quite small. The ends of round pickets are many times cut off square, or a little rounding, or pointed in a conical form, like those shown at figure 44. Figure 49 represents one of the plainest style of tops for square or flat pickets, with the corners sawed off. Figure 55 is particularly adapted to enclosing buildings of Gothic order of architecture. When buildings are of the very plainest order of architecture, figures 51 and 52 would correspond quite as well with the work on the buildings as any other style. Figures 50 and 56 would be in good keeping with the architecture of a country villa, where the balconies and verandas are encompassed with a balustrade of turned balusters. When buildings are finished with a heavy box cornice, with roof rather flat, and square columns with level moldings, instead of a bead, or ogee, or ovals, figures 53 and 54 would be in good keeping with the workmanship of them.

125. The most expeditious manner of rounding the tops like figure 51 is, to put fifty pickets or so in a gripe, with the top ends all even, flat sides together, and set them up by the side of the work-bench, letting them stand on the lower ends, and shave the corners nearly round with a drawing knife, and then a few strokes with a joiner's hollow plane will make them all true. When all the corners are to be cut off, like figure 52, a lot of them may be put in a gripe or they may be cornered with a drawing knife, while they are held in a vice, or they may all be nailed on the rails of the fence, and cornered with drawing knife and bench plane. Figures 50, 53, 54, 55 and 56 are usually put in a gripe, with top ends even, and laid on the work-bench, and some parts cut with a back saw, and rabbet plane, or a joiner's dado, or with plains called hollows and rounds. A joiner's dado, for such work, is a very useful tool. There are many other forms for picket tops, but these must suffice for a work of this character.

STONE FENCE.

126. Stone fence, or stone wall is about the best and most durable and efficient fence that can be erected; when it is properly built; but some farmers who have an abundance of stone, have no confidence in stone fence, because it tumbles down so frequently in places, making gaps for the ingress or egress of hogs or sheep. But the difficulty is, almost always, attributable to imperfect workmanship in building. Stone walls are, usually, built by jobbers, who itinerate through the country, in search of labor; and who, sometimes, understand the business well, and will lay up a good wall if their employer understands what constitutes a good wall and insists on having his work done to order. Jobbers often will slight their jobs all they possibly can, and if they discover that their employer does not know when the work is well done, they will toss the stones together, any how, and pocket their wages and be off; but if they have their orders how to lay up a wall, and these are insisted on at the time of negotiating, and the overseer watches the builders, there

will be little danger of stone walls tumbling down in consequence of having been laid up in an unworkmanlike manner. Jobbers will often insist that it is just as well to lay the foundation stones on the surface of the ground, as it is to lay them eight or ten inches below the surface. If the foundation stones were always flat on the bottom, and large enough to extend entirely across the bottom of the wall, it would be just as well to lay them directly on the surface of the ground, because the entire wall would settle bodily and evenly, and if the frost gets under it, it will be raised evenly. But when the foundation consists of small stones, either flat ones or bolders, they will not settle perpendicularly. Large bolders, when laid on the surface of the ground, will seldom settle straight down, because when more rain runs off of one side than the other, the soil in one place will become softer than it is in others, and if the stone rests on that point it will be very liable to slide a little, sideways, in that direction. And when the foundation is a part small bolders and another part large flat stones, and another portion something else, the wall will not all settle alike, and the frost will not lift it all alike, and by constant lifting and letting down, here and there, the wall will begin to spread out in places, and in a few years, will tumble down. A wall may often have the appearance of being well laid up when in reality it has been very imperfectly done. It requires the exercise of good skill and judgment to place every stone in the best position, so that it will not roll or rock about at the slightest touch. Almost every stone has one side a little broader and flatter than the other sides, and the best side should be always laid down, so as to keep the stones from rocking about. If a stone has one good face side, and will lie more substantially with that side down, let it be laid in that position, rather than to set it on the edge for the sake of having the face side outwards. It is desirable to have a straight and smooth face to the stones in a wall, but when this object cannot be secured without detracting from the permanence of it, it is best to place the best sides down, even if the wall is not quite as even and smooth as we could desire. A wall may be just as strong when the stones all have a rough and uneven face, as if those rough and uneven corners were all knocked off and a smooth face made on them. When jobbers lay up a wall, the stones of which are mostly small bolders, if they are not watched closely, they will lay up a row for each face and then throw in small stones, without any order at all, to fill up the middle. But such a wall will stand but a few years, because the sides will bulge out in a short time, and it will fall flat to the ground. The stones of a wall should all lie flatly, and lap on one another, clear across the wall. Such a mode of laying stone will keep the wall from spreading or bulging out in places.

127. Stone walls are, usually, built by the perch or by the rod, running measure, with the foundation and top of a given width and the wall of a given height. A perch of wall is sixteen and a half feet long, and a foot square, or sixteen and a half cubic feet. A rod of wall may be two feet wide or ten feet wide, and almost any given height, but always sixteen and a half pickets. When this mode is adopted the acorns should be put on tight

feet long. When walls are laid up dry, the faces or sides should be laid battering, as they will stand much more permanently than when the sides are built perpendicularly. When the stones are mostly small and round, the faces should be laid more battering than when nearly all flat stones are used. If the stones of which a fence is to be made, be nearly all large and flat ones, it is quite as well to lay the faces perpendicularly as battering. The most important idea to be kept in mind in laying up a stone wall is, to have all the stones laid in such a manner as to bind the wall together, from face to face, so that the faces will not separate. The following figures will enable the farmer to know, if he is not a practical stone layer, whether a wall is laid up in a workmanlike manner, or whether it is performed in a slightly, job-cheating way. Figure 57 represents a transverse section of a fence, or stone wall which is laid so as to bind the two faces together, and which is done in a workmanlike manner. It will be perceived that there are no large holes between the stones, and that they are all laid flat, and not pitching this way and that way, and are laid so as to bind from face to face.

Fig. 57. A section of wall well laid.

Figure 58 shows a section of the same wall, of the same size, of the same kind of stone, and having faces equally as good as figure 57, but which is laid up very slightly, with merely a row of stones for each face, while the middle of the wall is filled with stones thrown in promiscuously, without being placed so as to lie firmly, and without having the face stones chocked on the *inside*. It is always very important to have the face stones well chocked on the inside. It is of little or no importance, usually, to chock stones on the face side. But if face stones are not well leveled up and chocked up, on the inside, especially in erecting a wall with a single face along a bank of earth, a wall is sure to bulge out and fall, in a few years. This explains, in a great measure, why walls under a house or barn often bulge into the cellar and fall; the face stones were not well chocked on the inside, and a small force, produced by the superincumbent pressure of a heavy building, or by the freezing and expansion of the bank, against which the wall is erected, will thrust the walls into the cellar. When long stones are laid in a stone wall, and the ends or sides within the wall do not rest, one on the other, if they are not chocked clear to the ends, (not back six or eight inches from the ends,) the superincumbent pressure of the stones, which rest on the ends of these long stones, will tend to bring the ends together, and to separate the ends at the face, thus bringing them into a position to be forced, or thrust easily from the center of the wall.

Fig. 58. A section of wall improperly laid.

MANIPULATION IN BUILDING A STONE WALL.

128. The first thing in building a stone fence, usually is, to haul the stone; and they are, usually, thrown in a long row, exactly where the

fence is to stand. This is always wrong. If stones are gathered, from year to year, and hauled to a given place, for the purpose of making a stone fence, the place where it is to stand should be staked off, and no stone should be dropped within four feet of the point where the face of the wall is to be, on both sides of it. If the wall is to be made six or eight feet wide, on the bottom, no stone should be dropped nearer than six feet, especially if they are mostly large ones. It is a great fault with most farmers, who build stone fence, to get their stones too close to the wall. It is but the work of a few moments to tumble a large stone six or eight feet; and it is far better to have a stone one foot too far away, than to have it a foot too close to obstruct the progress of workmen.

129. When a stone wall is to be erected directly on the surface of the soil, the stones may all be dropped in a long pile, where the fence is to be built; and then the workmen can commence at one end, and carry the stones back, and lay them up; and if they should not be abundant enough, without carrying them too far, in some places, they can be hauled along the side of the wall, where they are needed. But, we do not advocate the practice of erecting a stone wall on the surface of the ground, because it will not settle alike unless the soil is of a uniform quality; and as the frosts of winter will raise it, whenever it freezes beneath the foundation stones, it is very liable to freeze in freezing weather on the windward side *first;* and perhaps it will not freeze on the leeward side at all, under the foundation stones. When this is the case, when one side of a stone wall is lifted by the frost, and the whole of it does not go up bodily, the stones will, most of them, be displaced a little. And again, supposing that it has all been lifted bodily and evenly, when the ground comes to thaw, it is not at all likely to thaw evenly, and settle uniformly. This will displace the stones a little, and a large number of such little displacements will soon produce bulges in the wall, and as soon as a wall commences bulging, here and there a little, it is very liable to fall in a few years. In order to build a wall that will stand as long as any man will need a fence, the soil where the fence is to stand should all be thrown out, to a depth which will insure safety from settling, or from heaving by frost. In some localities the necessary depth will be only four inches, while in other places, perhaps in the same field, a depth of from eight to fourteen inches will be necessary. The foundation stones should be well laid, and chocked up all round. If a large stone, for instance, has but one flat, or smooth side, and has more the appearance of half of a globe than anything else, it is best to dig a hollow in the hard ground, which will correspond well with the round side of it, and place it with the smooth or flat side up.

130. The width of the wall on the ground must be determined, in part, by the size of the foundation stones. Should there be a good number of large bolders, from four to five feet in diameter, it will be best to have the wall about that width. Between the bolders let a row of good stones be laid for each face; now fill up the middle, and level it off entirely across the wall. Then, if a large flat stone, or a number of them, can be obtained,

lay them on the long way across the wall, and chock them well, so that a man may step on them without rocking or moving them. If there is a number of ill-shapen, rough-looking bolders, let them be laid on such places as the tops of the large flat stones, and chock them well. Let the workmen be particular to break joints well, i. e., let a stone be laid directly over the joints of the two below it; let long stones, from each face of the wall, extend inward as far as possible, and if a few can be obtained which will extend from face to face, they will render the wall doubly strong. When there are more large bolders than can be laid in the foundation course, if two or three men cannot lift them two or three feet high on the wall, place a strong bench by the side of the wall, and lay a couple of plank with one end on the bench, and the other on the ground, and roll the large stones up this inclined plane with a cant-hook, and lay it carefully on the wall. In this way one man may handle stones with ease, and place them on the wall three or four feet from the ground, which three or four men could not lift directly to that place. When there is stone enough to build a wall, we will say three feet wide on the bottom, and two feet or two and a half on the top, and three feet high, if there should be enough bolders, about two feet in diameter, to form a single row the entire length of the fence, they should be left till the wall is finished, from three to four feet high, as the case may be, and then these bolders should be laid carefully *on the top of the wall* close together, and chocked up well all around. Such bolders will be more efficient in building a fence, when placed in such a part of the wall, than they would be if they were placed near the bottom, but they should be assorted, and those of a given size should be placed together. If we would make a fence five feet high, for example, it may be made three feet high as far as the bolders, which are two feet in diameter, will extend, and then, if a lot of bolders are but twenty inches in diameter, let the wall be laid a few inches higher, so that the tops of all the bolders will be of a given height. It is a very great help, in putting on these cope stones, to lay two strips of boards, about three inches wide, and the longer the better, on the top of the wall, with their edges even with the faces of the wall, and then lay on the cope stones, letting them rest on these strips of boards. A board or plank, as wide as the top of the wall, is often laid on the top for the cope stones to rest on, but two strips of boards, I think, are preferable, because they are cheaper, and they do not require so much chocking on the sides, and any corners or points of the stones will set down between these strips much better than they would rest on a wide plank.

What has been penned in the preceding paragraphs has particular reference to walls which are made of all kinds of stone. We shall now notice the best mode of building,

COBBLE-STONE FENCE.

131. When stone fences are made of small stones alone, where there are no flat stones to bind the wall together, small strips of wood, called *binders*,

about an inch wide, and one-fourth of an inch thick, which are usually split out of cedar or some other durable wood, are laid between all the courses of stone, as thickly as thought proper, but one binder extending entirely across the wall to every six or twelve inches will be sufficient. If the stones are all quite small, it would be well to use more binders than if the stones were larger. The stones will settle a little into these wooden binders, and keep the sides from bulging out and falling down. The binders should not extend beyond the face of the wall far enough to allow cattle to move them; they should be cut of different lengths, when the wall batters on both faces, so as to be just as long as the wall is wide, as the wall increases in height. When any of the binders extend beyond the face of the wall, the ends should be sawed off even with the stones. This mode of building refers more particularly to walls about thirty inches wide on the bottom and a foot wide at the top, and from three to four feet high. This kind of wall is sometime covered with a row of square stones, sometimes one foot square, and sometimes stones from two to six feet long, and from four to ten inches thick, and as wide, or even a few inches wider, than the top of the wall, are placed carefully on the top. Sometimes a stick of timber is placed on the top of the wall, and the top of it dressed in the shape of a roof of a building, and cased and painted. Sometimes, again, when such a wall is from three to four feet high, the top is beveled off, and a board of some durable timber is placed on the top, and stones of a given size, which have been reserved when the workmen were carrying up the wall, are placed on the top close together, and chocked up well on both sides. It will require the exercise of a little skill to place these cope stones in the most firm and permanent manner. A large stone should be placed at the end to keep them from moving readily, and the others should be placed in the best possible manner for laying firmly and wedging the entire length of the wall. Sometimes such walls are finished with two or three rails in height, or what is much better, long poles, staked and ridered.

132. Throwing a bank of earth against each side of a wall, about too feet high, and sowing grass seed on it, is highly recommended by some, and equally denounced by others. When a wall is resting on a good foundation, below the influence of frost, there can be no advantage in banking up the sides of a wall, excepting this, it prevents stock from approaching so closely to it as they could do if it were not banked up, and consequently they are thus deprived of the advantage they would otherwise have to rub and hook and displace any of the stones. Many farmers contend, and with very plausible reasoning too, that when a wall is banked up the dirt finds its way between the stones, filling all the spaces so completely that a frost affects a wall just as much, and sometimes even more, than it would if it were built on the surface of the soil. If a wall is properly laid up, a bank of earth on each side will not make it stand any longer than if it were not there. The farmer can do as his own judgment may dictate in reference to banking up the sides.

133. Another thing of no little importance in building stone fence is, to lay all the stones as nearly level as may be practicable. In making a wall up or down a slope, the workmen should always work *up hill*, laying the stones level, instead of laying them parallel with the surface of the ground, on which the wall is to stand. When stones are laid sloping in a wall, they are moved much more easily than when they lay in a level position, consequently a wall built in such a manner would not be as strong as it would be were the same stones laid level.

134. Whenever a wall is built along the hillside, and the dirt is hauled down against it, the face of the wall should be more battering than are the faces of a double faced stone wall. It is a very great error to lay up a wall in such places with the face perpendicular, because the earth will freeze and expand behind the wall, and unless it is several feet in thickness, it will thrust it over in a very few years. Stone walls that are erected along the sides of abutments, should always be laid battering, lest the sides bulge out in a few seasons, and they fall. The face of such a wall should be laid battering not less than one foot in three. For example, if a wall be three feet high, it should be laid battering one foot, and if six feet high, two feet battering. And there is another very important consideration in laying up such a wall, which is almost always entirely overlooked, or not even thought of, which is this: the stones, especially the flat ones, instead of being laid level, as in other kinds of wall, should be laid *pitching inward* towards the bank or hill above, with their surfaces at a *right angle* to the face of the wall. When a wall is laid up in this manner, if the frost should ever thrust it over any, it would settle back again to its original position as soon as the earth behind became all thawed out. When a wall is built along a side hill, as has been mentioned, it should never be less than two feet thick clear to the top. It should be as thick, or even thicker at the top than at the bottom. The wider it is, the less liable it is to be thrust over by the frosts of winter. In localities where there is an excess of water in the soil, arising from springs, a good ditch should be made and well tiled or stoned two or three feet *above* the foundation of the fence, in order to receive the water before it should saturate the earth under the foundation of the wall. This precaution will keep the dirt about the wall more dry, and consequently less liable to heave by freezing.

DITCHES UNDER STONE WALLS.

135. It is a very common practice with some farmers, to throw out the earth, where a stone fence is to built, to the depth of thirty or forty inches, and from two to four or five feet wide, or as wide as the wall is to be built at the surface of the ground, and then fill this channel with small stones thrown in promiscuously. In this operation they have two or three objects in view—draining the soil, preparing a good foundation for the fence, and a place for the surplus stone. But this is a very expensive way of disposing of surplus stone of any kind. It would be far more economical to lay them up even on the top of a wall that is already high enough, than to bury

them beneath the soil. We do not approve of nor advocate the practice of forming a channel for water beneath a stone wall, by simply allowing the water to percolate between the stones, because dirt will keep working towards the bottom, and mice will haul in dirt in places so as to stop the passage of water entirely. When it is desirable to have a passage for water under a stone fence, the earth should be thrown out from one to four feet deep, to suit the judgment of the proprietor, and then a channel should be dug in the bottom of this trench from six to twelve inches deep, and a good throat laid, as in an ordinary ditch, and well chinked with small stone, and then filled with the kind of earth that was taken from it, and well trod down even with the bottom of the large trench. If there should be much water, it would be necessary to make a large throat; but whether a large or small throat were made, the workman should exercise unusual care to do every part of the work in such a manner that mice could not possibly find their way into the throat of the ditch. If the ditch be well chinked with small stone, and then about six inches of hard earth be well trod down on these stones, mice will never try to burrow in it, and the water will have a free channel as long as water runs. A row of tile laid beneath a stone fence, would be the most complete manner of making a permanent channel for water; but where stone is abundant, economy dictates that they should be used for this purpose.

DITCHES ON BOTH SIDES OF A WALL.

136. Many farmers seem to prefer to have a deep ditch usually open on both sides of their stone walls, to having a ditch directly beneath the wall, as has been recommended. The method pursued in such cases is, after the wall is finished, to cut a large open ditch on both sides of the wall, say three or four feet wide on the top, according to the depth of it, and about one foot on the bottom, leaving sufficient space between the ditch and the wall to receive all the dirt, so that when the ditch is finished the embankment on each side of the wall will correspond with the slope of the sides of the ditch. The sides are then sown with grass seed.

137. Although this style of stone fence is very common and much admired, it is decidedly objectionable on account of the expense incurred in cutting two such large ditches, and also the amount of land occupied. If the two ditches are made three feet wide on the top, and the spaces from them to the wall be four feet on each side, and the wall three or four feet wide on the bottom, and as we cannot plow nearer than about two feet to a ditch, it will be perceived that the space occupied by such a fence will be about twenty feet wide or more, when less than half that space, with a ditch beneath the wall, would be much cheaper and subserve a better purpose.

HALF WALL.

138. In localities where stone is not very abundant, and where there is some fencing timber, a very good, economical, and durable fence can be made by laying a stone wall two or three feet high, according to the amount of stone at hand, and then by staking and finishing with two or

more rails, as may be necessary to make it of sufficient height to turn stock. Some farmers finish their stone fence by laying on the top of the wall, long poles, say twenty or thirty feet in length, and then stake it, and afterwards lay on heavy poles for riders.

139. Another mode of building half wall fence is, to set the posts, as for a whole board fence, and then lay up the wall about half as high as the fence is to be made, and then nail on the two top boards. If the boards should be nailed on before the stone are laid up, they will be very much in the way of the workmen.

140. Another manner of finishing a half wall fence is to set the posts, and after the wall is laid up, fasten rails to the posts with wires, as shown by figure 12, paragraph 37, skeleton fence. When this mode is adopted, rails, or poles twenty feet long may be used instead of rails.

A CHEAP WALL OF QUARRIED STONE.

141. Whenever stone are quarried expressly for a fence, and they can be taken from the quarry from one to two feet wide, and from two to eight or ten feet in length, a small amount of stone may be made to build a long line of fence, in the following manner, which will stand firmly, as long as one man will need the advantages of a good fence, and subserve as good purpose as those walls in which there are three or four times the amount of stone.

142. If the soil, where the wall is to be built, is at all inclined to be a little wet, let a ditch be made as directed (paragraph 135), and then throw up a ridge of earth, over the ditch, not less than two feet high, and three feet wide on the top of it, and six feet or more at the bottom. Let it all be smoothed off level, and grass seed sowed on it. Allow it to settle for one year or more, and then lay the stone wall directly on the top of this ridge.

143. The object of the ridge of earth is to save stone, and the object of seeding with grass seed is to prevent the rain from washing it down, and the object of letting it settle one year, or more, before the wall is laid on it, is, to have the earth, the entire length of the ridge, of a uniform density, so that the whole wall will settle uniformly. Other advantages of such a wall will be readily perceived without mentioning them.

QUARRYING STONE.

144. The first step in taking stone of any kind from a quarry, is, to remove the dirt from a large surface. Sometimes this may be done with a team and scraper, and sometimes, when a stream of water is near it may be turned out of its natural course and made to wash the dirt away, and sometimes it must be removed with shovels. When the surface of the stone is all laid bare, if the stone is found with regular vertical and horizontal seams, at the distance of a foot or so, it will be very easy to get them out. It requires the exercise of a little judgment and skill to quarry stone, or the operator will make bad work, by damaging many good blocks of stone, that might, by a skillful workman, be taken out of the quarry,

of a very desirable size and form. Stone are not very elastic, and the operator should bear in mind that he cannot drive in wedges in the seams of stone as carelessly as he may in a block of wood. Stone will break before they will render or give but little, therefore, it will not answer to drive in wedges all in one place.

145. A workman in a quarry needs a half score of wedges, many times. They should be about four or five inches long, one and a half inches wide. and about three-eights of an inch thick, of the very best iron, and steel pointed. These should be driven in the seams not more than one foot apart, and all driven at one time by striking them, alternately, one or two blows at a time. This will open a seam uniformly, without danger of breaking a stone. But if a wedge be driven in at a corner, for example, unless the stratum is very thick the corner will be very liable to break off. Where the courses are laid bare, having vertical seams, from two to four or five feet apart, and the strata from four to twelve inches thick, the surface should be marked off in a square form, of the size which it is desirable to have the stone, and then a row of holes may be drilled eight or ten inches apart, where the stone is to be broken, and iron wedges driven into these holes, until the stone separates. Two pieces of half round iron should be placed in each hole, leaving a space in the middle of each hole for a flat wedge to enter between the two pieces of half round iron. When the strata are not very thick, and the stone are such as may be broken with fire, the strata may be broken by fire instead of drilling holes, and separating with wedges. It is usually best to drive most of the wedges at the end, in lifting a stratum of rather thin stone, although some wedges may be driven on the side, but if the wedges should be driven mostly on one side, a stone will seldom break square across the stratum. When the strata are rather thin, by cutting a groove with a cold chisel, about an inch deep, where it is desirable to break the stratum, if the wedges be driven to the side opposite to the groove, the stratum will break, very true, where the groove has been cut.

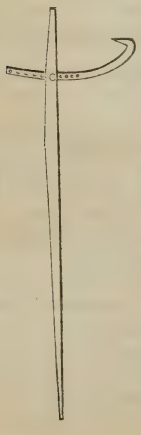


Fig. 59. A Canthook.

TOOLS FOR HANDLING STONE.

146. In addition to a good crowbar or two, and handspikes, a good canthook, represented by figure 59, is a very useful and convenient implement for handling bolders, which two or three men could not handle with crowbars without much difficulty. But with a good canthook one man can roll along a bolder of six or eight hundred pounds with ease, and by using a couple of plank he will be able to load such a stone on a sleigh or stoneboat, in a very few minutes.

147. The handle of the canthook is, almost always, made too large and clumsey. It should be about six feet in length, and of a uniform taper, from the mortise, where the hook enters it, to the end, which end need not be

larger than the end of a fork handle. The other end may be tapered off, as shown in the cut. At the mortise it should be about two by three inches square, or even smaller, if the timber be of the best quality, otherwise it must be larger. The hook should be made of the best iron, about inch and a half wide and three-eighths of an inch thick, with half inch holes every two inches, and from twenty to thirty inches long, according to the size of stone, or logs to be rolled with it. At the hook end it must be made much heavier and stronger than the other part of it. The curvature of the hook is a very important feature of it. If it is curved but little it will hook on a large stone or log, very readily, and will not hook on a small one. But, if the curvature of it will admit of its hooking to a small stone, it will, usually, hook on a larger one, except it is very large. The bolt which holds the hook should work easily, in and out, and be fastened with a leather key.

148. The grapple hook, figure 60, is used for hooking on to large stone with a team, in rolling them over and over, or in lifting one end of a stone, so that a chain can be passed around it, when one end of it is in the ground. It is very convenient in a quarry, for hitching a team to a corner of a large stone, when it is desirable to slide it a little. With three or four such hooks, a stone may be slung up, when it would be very inconvenient getting a chain round it.

Fig. 60. A Grapple Hook hitched to a large boulder.

149. The grapple hook should be made of about the same curvature of the iron part of the canthook (fig. 59), with a link and ring in one end, as shown in the figure 60, for the purpose of hitching a chain to when in use. It should be made from eighteen to twenty-four inches long, of the best iron, with the point of the hook laid with steel. The hook should be large enough to retain its shape, without bending, even when two teams may be hitched to it. At the hook end, where it is exposed to the greatest strain, it should be about three-fourths of an inch thick and two inches wide. The other parts need not be half as heavy as this.

150. Figure 61 shows a portion of a platform to a wagon or sleigh, with a windlass attached to the hind end, for the purpose of loading stone, which would weigh from one hundred to three or four hundred pounds. One man can roll a stone which three or four men cannot lift on the wagon, and by having a windlass on the hind end of the wagon, one man can raise a large stone on the wagon in one minnte, with ease. In loading a stone, the fore end of the platform should be fastened down, so that it cannot tip up, without raising the forward wheels of the wagon. Hitch the chain around the stone and raise it as high as the top of the

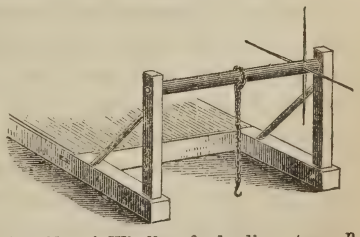


Fig. 61. A Windlass for loading stone on a wagon.

platform, and then let a board be slid under the stone, with the two ends resting on the sills of the platform. The stone can then be rolled forward on the platform and another raised in the same manner.

151. The windlass should be about three inches in diameter, of good timber, and about thirty inches above the sills of the platform. The sticks for turning the windlass should be, at least, four feet in length, and if the timber be very tough, one inch in diameter is large enough for ordinary purposes. The ends of the sills should extend beyond the cross piece about eighteen inches, as shown by the figure. A small chain is best although a rope would subserve a good purpose for winding up on the windlass.

152. For loading stone on a wagon, which will weigh from four hundred pounds to a ton or more, a set of sheers and tackles (figure 62) is about as convenient and efficient as any thing in the line of cheap implements, which can be made use of. Almost every farmer often sees the need of such an apparatus, for many purposes, besides loading stone. It hardly needs a description, but to aid the beginner we will give the chief dimensions. The sheers should be not less than sixteen feet in length, of light timber, and should be larger in the middle of the sticks than at the ends, to keep them from bending. The single sheer, or the one to which a windlass is attached, for winding up the slack rope, should be in the middle of a size equivalent to a scantling three by four inches square. The other two sheers may be two and a half by three inches in the middle, and tapering to each end to two inches square, in order to render them as light as possible. At the upper end of the single sheer, an iron rod about seven-eighths of an inch in diameter, and twenty inches long, should be fastened by passing through it, for holding the other two sheers, which should have an inch and a quarter hole in their upper ends, for receiving the ends of this rod in the single sheer. The tackles may be made by almost any mechanic, with cast iron sheers. A rope, an inch in diameter, is large enough to hold one and a half tons, when the rope is three double, or three sheeves in the upper block of pullies.

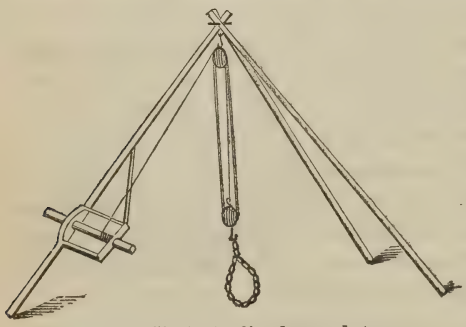


Fig. 62. Gin for loading logs and stone.

153. Such an apparatus is very convenient in hoisting large stone on to any part of a stone wall, and especially in placing large stone on the top of a wall. It may be used also very advantageously in loading logs and timber, and such like, on a wagon. In extensive quarries a crane will be found to be more efficient and convenient than almost any other apparatus for hoisting the stone from their bed on a wagon or other vehicle. As cranes may be seen in every locality where stone quarries abound, we do not think

it advisable to give in this place a cut and description of one. When the farmer has a quarry of any kind of stone, if he has not in his employ a man who has a good share of practical experience in quarrying stone, he will find it very much to his interest and convenience to visit some extensive quarry, and spend a day or so in witnessing the manipulations of the workmen, and in making inquiries of the foreman and proprietor in relation to the business, and in examining the tools used in quarrying. A day or two spent in this manner may be worth hundreds of dollars to an individual, in enabling him to start in his operations in the most efficient manner. Scores of men have been in the possession of excellent quarries, but who, for the want of getting *started right* in the quarry, and not knowing exactly what they really needed, have blundered along at a very great useless expense and inconvenience for a long time, or many times have entirely abandoned the operation as a non-paying business, when a day or two spent in examining the machinery, &c., of an extensive quarry would have enabled them to *start right* and progress with all desirable rapidity and efficiency.

BREAKING STONE WITH FIRE.

154. Many kinds of stone may be broken very readily and very expeditiously with fire. Large bolders, when a fire is built on them, will in a short time separate into small pieces, and many times these pieces will have straight edges and smooth and true faces, and may be used in a foundation for a building, or in stone fence, with no little economy. When a large bolder is mostly below the surface of the ground, let the earth be thrown away from it all around as low as the middle of it, and then pile on a lot of old rails or pieces of stumps, or even good wood, and it will soon crack into pieces, so that they may be pryed out with the crowbar. Should it not be broken clear to the bottom, apply the fire again after the broken pieces have been removed. Sometimes after the fire has been burning for a few minutes, the top of the stone will be covered with large scales of stone, which should be immediately removed in order to allow the fire to come in contact with the unbroken stone. Some kinds of stone that are taken from the quarry may be broken very square and true into almost any desired shape. In many quarries stone are often taken out ten or twenty feet in length, and from six to ten or twelve inches in thickness, and sometimes from one foot to three feet in width, with straight edges and true and smooth sides. Now in order to break them in pieces of a desirable size, let little fires be made with hard dry wood across the stone where it is desirable to break it, and in a few minutes a seam will be formed so that a crowbar will easily separate them. We have often broken large flat stone very true and straight with fire, by laying a scantling about four inches wide on the place where it is to be broken, and then shovel dirt on both sides of the scantling about an inch in depth. Take up the scantling and make a fire with short pieces of dry wood, split very fine, the whole length of the stone where it is to be broken. Small hard wood chips are the most convenient article to make a fire with in such a place. The dirt is to prevent the fire from heating the stone on each side of the line where it is de-

sirable to have it broken. If the fire burns uniformly entirely across the stone, it will require but ten or fifteen minutes before it will crack, when the fire should be immediately removed, lest it should injure the edges of the stone. Small thin stone may be broken very readily by heating a large bar of iron and laying it on the stone where it is to be broken.

155. Some kinds of stone will not break at all with fire, and some kinds will crumble to pieces before they will break in two parts. The beginner can soon learn, by a little observation and experience, which kinds may or may not be broken with fire.

FENCE POSTS.

156. There are several considerations of first importance in making fence posts, which should not be overlooked. One is the *length* of posts. Posts are cut many times nearly one foot longer than is necessary. If all the logs of a tree be cut one foot longer than necessary, there would be waste of timber enough in one tree many times to make a cut for posts. The farmer should calculate how deep he intends to set the posts, and how long they are to be above ground, and then cut them but three or four inches longer than that length.

157. Another thing is the *size* of posts. When timber is good and well seasoned, a large post will always outlast a small one; therefore it is not a bad fault, so far as durability is concerned, to have posts large; but on the score of economy, it is not best to have them very large. It is much better to have them too large than too small. A post six inches square is much better, and will last longer, than one four inches square; but it would not be an economical manner of working up timber to make ordinary posts six inches square. For ordinary fence, sawed fence posts may be about four inches square at the lower ends, and two by four inches at the upper ends; but some prefer to have them sawed five by five at the lower ends, and five by two or three inches at the tops. For a high fence, like fig. 28, this last size would be better than a size smaller. In splitting fence posts, when a portion of a log is rather large for two posts, and too small for three posts, it is much better to make them a little too large than too small. It is much more economical to have posts sawed out than to split and hew them, when a saw mill is not more than two or three miles distant, providing the timber is large. It is not practicable to split as many posts out of a log, even when it splits well, as can be sawed from the same amount of timber. By sawing the lower ends large, and the upper ends proportionally smaller, there is always a saving of timber, and the posts are of a much better form. If timber is very small and will split good, it might be best to split them out instead of sawing them. Sometimes, when small timber is winding, four posts, worth fifty cents or more, might be sawed out of a small log which could not be split into posts, and which, if not sawed, would make only one post.

158. Another thing, which seems almost superfluous to mention, is the *kind of timber* for posts. Red cedar and mulberry are perhaps more durable than almost any other kinds of timber; yellow locust, oak of different kinds, butternut, red elm, red beech, and many other kinds not men-

tioned, will make good posts. The butt ends of trees, when the trees are sound and healthy, are usually more durable than cuts near the tops of the trees. It is always very poor economy to make fence posts, and especially gate posts, of perishable kinds of timber, such as sugar maple or bass wood, and such like. All kinds of posts should be seasoned at least one year before they are set in the ground.

159. *Hewing posts.*—When posts have been split out, the most convenient mode of scoring and hewing them is to lay the post to be hewed on two large blocks, or logs, and then drive in two stakes, or pins, about six or seven inches apart, in one log, and let them extend beyond the surface of the log eight or ten inches, and key the post with a wedge in the desired position between these two stakes, then line it and hew it. Some men prefer hewing their posts after they have been set in the ground, but the practice is not a good one, because it loosens them.

160. *Sharpening posts.*—When the ends of posts are to be sharpened, if they are so large that a man cannot hold them erect with one hand, with the post standing on a firm block, while he sharpens it with an ax in the other hand, they may be fastened with a wedge in a gain cut in a heavy log, in a device similar to the one for holding posts when they are to be hewed, as shown by figure 63. It requires the exercise of a little skill to sharpen a post in a proper manner for driving well. The bevel or slant should be of exactly a given angle on each side of the post. The following figures will give some correct idea on the subject: figure 64 represents a post sharpened in the most proper manner. A post sharpened thus, when it is being driven, will go straight down, if the point should not hit a stone. Figures 65 and 66 represent two posts improperly sharpened. Although they may go straight down, when sharpened like figure 66, they will drive very hard, because they are too blunt. When they are sharpened like figure 65 it is almost impossible to keep them, when driving them, in a perpendicular position. Sometimes, when posts are not entirely straight, the sharpening must all be done on two or three sides of it only, as the case may require. Figure 67 will furnish a very good idea of the most proper manner of sharpening a crooked post, in order to have it drive true. The dotted lines will show on which side the post should be sharpened. The idea to be kept in mind in sharpening a crooked post is, to work by a line drawn from the center of the top of the post, figure 67, at *a*, to *b*, and then bevel the end on both sides of this line, so that the angle of the bevel-

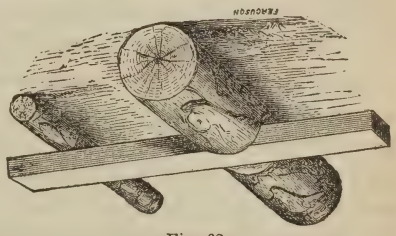
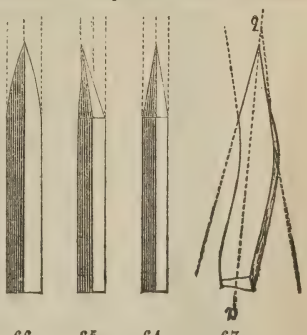


Fig. 63.



66. 65. 64. 67.

Mode of Sharpening Fence Posts.

ing will be nearly the same on both sides of the line *a b*. It will be perceived by the figure that the sharpening is almost all done on one side, at *b*, but a thin chip was taken from the other side. A workman, who has a mechanical eye, will sharpen posts with all desirable accuracy without a line. He will cast his eye from end to end of a crooked post, and at a glance observe about how much must be cut off on each side, in order to make it of a true taper, and then will snatch up his ax and cut it off, while another man would be getting ready to sharpen it. In sharpening straight posts, a workman must calculate to have the point at the center of the post, and to have the cut on each side of the post of a true taper, from fifteen or twenty inches from the end, according to the size of the post, to the point, like figure 64. If these rules, which may seem trivial to some, are observed, the beginner will soon be able to sharpen his post with necessary accuracy. If the ends of posts were of a true taper from the points to that part which is at the surface of the ground, they would enter the ground much easier, but they would not stand as well as those would which have a short taper. Pointed posts are far more liable to be lifted out by the frost than those which are of full size clear to the end, and we would not recommend the practice of pointing fence posts; but as farmers will persit in doing it, we have thought proper to give some practical hints on the subject, to aid the inexperienced workmen in doing the job in a workmanlike manner. Let the farmer avoid sharpening posts like figure 65.

REMEDY TO PREVENT POSTS BEING LIFTED BY THE FROST.

161. When posts, having a straight end of uniform size, are set in the ground, unless they are set three or four feet deep in the ground, they are very liable to be lifted out of the ground in a few years by the influence of the frost. In dry localities, however, the freezing and thawing of the ground has little or no effect on them. Setting them very deep in the ground is the usual remedy againt their heaving out in the winter, but a more convenient and cheaper one is to bore a two-inch hole through the bottom of each post, and drive in a hard-wood pin, allowing it to extend beyond the surface of the post about four inches, and then in setting the posts place a stone on each end of the pin, and let the dirt be well rammed down on the stones. Another and better remedy is to cut a notch on each side of the bottom of the post, about four inches from the lower end, and ram the dirt well into these notches, or place stones in them, as shown by figure 68, which represents a post with stones placed in the notches. Posts may be cut on both sides, if they are of good size, so that in the thinnest place they will be not more than one and a half inches thick, without injuring their strength or durability, because at the bottom of a post, which is from two to three feet below the surface of the ground, but little strength is necessary; and at that depth in the ground a post decays very slowly. It should be remembered that posts decay most at the

Fig. 68. Mode of preventing Fence Posts being lifted by the frost.

surface of the ground. When posts are rather small, a notch may be cut only on one side of them, for receiving the stone. This is a most effectual remedy for the heaving of posts by frost.

162. DIGGING POST HOLES

Is a part of fence building which may be performed at "odd spells," and may be done by the forces of the farm which are very awkward and unskillful in everything they attempt to perform, providing the work is all laid out for them, so that it will be barely possible of doing anything wrong. In the first place set two stakes and plow a deep trench, as stated, (sec. 94,) if the saving of labor is any object, and then stretch a line four or six rods long, and have a little pole, as long as the distance is to be between the posts, from center to center, and measure along the line, and stick a little stake exactly where the center of every hole is to be made. With the spade cut a circle in the sod or dirt around these little stakes, and throw out the dirt with the spade for one foot or so in depth, if the earth is not too hard to be spaded with facility. Let the digger be careful not to work the holes so far on one side of the center that the posts cannot be placed in range with each other. There is no necessity of digging the holes for ordinary fence posts more than one foot in diameter. If the ground is very hard and strong, it must be picked up with the crowbar or spud, and taken out with the dirt spoon. If the ground is not strong, the post-hole auger (fig. 87) may be used to great advantage, especially after a hole is two feet deep. In digging large holes for gate posts, or straining posts for wire fence, which are to be four feet deep, an expert digger will sink such a hole much the quickest, by stepping down into it, and by making it at least thirty inches in diameter at the top, and nearly two feet at the bottom. The holes for fence posts should be large enough to admit the rammer (fig. 89) freely all round them when they are being set.

Fig. 89. A rammer.

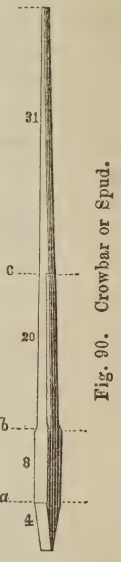


Fig. 90. Crowbar or Spud.

Fig. 92. Dirt Spoon.

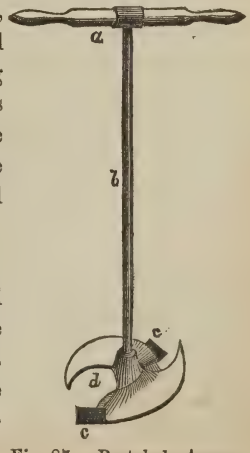


Fig. 87. Post-hole Augur.

163. SETTING FENCE POSTS.

Let the post be placed in the hole so that it will almost touch both the upper and lower line, (see mode of adjusting the lines, 96,) and throw in a little dirt, say enough to fill the hole around the post not more than two inches after it is well rammed; put in as much more and ram it, and the

post will stand without holding it. Be careful in ramming not to move the post by ramming too hard on one side of it. Be very particular in making the bottoms of the posts firm. Let the dirt be well rammed in to the top of the holes, by filling in a little at a time, and let the earth be raised around each post a little above the level of the ground, with the hardest kind of dirt. This will keep the posts from becoming loose. When small stones are used for filling the holes around the posts, they should be placed with care, and in such a position that, by being rammed a little, they will hold the post very securely. When there is water in post holes, it must be bailed out, as it is not practicable to make a post stand firmly when there is water in the hole. Posts are sometimes set in grout, which is made of good sand and water lime, and poured among the stones which are placed in the holes around the posts. This renders them very firm, but the frosts of winter are very liable to injure it as deep as it freezes.

164. Posts are often set by driving them in a hole made with a crowbar; but as a general rule I never could like it as well as setting them in holes that have been dug. I have often practiced driving posts in the bottom of the holes after they have been dug two feet deep, and I have always found that this practice saves much digging, and the posts are more solid and quicker set than when the holes are dug as deep as the posts are to be set. By digging two feet, and driving one foot or more, posts will be sufficiently deep for ordinary fences.

165. In driving square posts a wrench is very necessary to keep them from turning from a right line when they are being driven. For this purpose an iron wrench, large enough to fit on the post, may be used, or a mortise as large as the post may be made in a piece of tough plank, or a gain may be sawed in the edge of a plank, and the posts held in the desired position by one workman, while another drives them with a sledge. When posts are driven without any digging, the workmen are too apt to drive them only twenty or twenty-five inches, instead of thirty-five and forty inches deep, as they should be. It is no easy job to drive a post three feet into the ground in some localities, while in others a post may be driven clear down with comparatively few blows. In such places driving posts is preferable to setting them in holes which have been dug.

166. CHARRING POSTS

With a view to render them more durable has long been commended by men who ought to pass for good authority on such subjects; but the beginner may rest assured that the practice is by no means a good one, as a post will last longer when not charred than when charred, and this is particularly true of green timber. I am fully persuaded that if posts of green timber be charred it hastens their decay. Charcoal, we all know, is very durable in the ground, but posts which have been charred are not all converted into charcoal. Simply a small portion of the outside, by being charred, is rendered more durable. But this does not exclude moisture from the wood inside or beneath the charred portion. There is a thin portion of wood just between that which has been converted into coal and the remainder of

the post which has not been affected by the fire, which has been heated almost to burning point, which will quickly decay, when the whole charred portion will afford no more protection from the influences of the weather than so much loose charcoal placed around a post. Posts are charred, usually, around the part that will come, after they have been set, just at the surface of the ground, because posts always decay first near that point; and if that part could be rendered as durable by any artificial means as the other portions of the posts, they would last as long as we could desire. When posts are charred they are almost always burned too much. It is necessary to form only a thin coal on the outer surface, which is just as efficacious as if coal an inch thick were formed around the posts.

167. In order to place the matter beyond a doubt, let two posts be taken from the same log, and from the same portion of the log, and let them be seasoned for one year, and then let one be charred, and both of them set in the ground where the soil and moisture are as nearly equal as they can be, and if the charred post outlasts the uncharred one, the result will be in favor of charring them.

168. STEEPING FENCE POSTS

In different kinds of antiseptic liquid, for the purpose of rendering them more durable, has been often practiced with very good success. The process has been denominated Kyanizing and Burnettizing timber, from the names of the inventors. Kyan used corrosive sublimate, and Burnett used chloride of zinc. A tank or vat is prepared, or a molasses hogshead will subserve a good purpose, and about one and a half measures of the dry chloride of zinc, to about one hundred measures of water, are put in the tank and well stirred together, when the posts are set in this liquid, and allowed to remain ten or fifteen days, or until they become thoroughly saturated with the liquid. They should then be taken out, and allowed to dry, under cover, until they are entirely dry. It is necessary to saturate only that part of the posts which is set in the ground, and a few inches above the surface of the ground.

169. Dr. Boucherie of Paris, France, has used, for this purpose, about one pound of sulphate of copper to one hundred pounds of water. It is contended that timber thus treated is rendered more firm, and will endure three times longer than if it had not been submitted to the process of steeping it in the liquor of an antiseptic character. In some localities there are companies, having suitable apparatus for impregnating large quantities of wood, with an antiseptic liquid, for bridges, ships, &c., and it is considered to be a process which pays exceedingly well.

170. The practice of boring a hole in posts, near the surface of the ground, and filling it with common salt, is but a modification of steeping. The salt soon becomes dissolved, and is absorbed by the wood, and thus preserves a small portion of the post for a short time. All these processes which have been mentioned are *chemical* processes of preserving wood. There are *mechanical* modes of preserving posts, of which I will mention

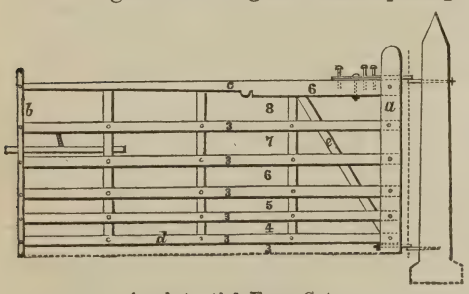
but one, which is, smearing the parts of posts near the top of the ground, for a few inches above the ground and several inches below it, with melted pitch or coal tar, or anything else which will exclude the moisture. A mixture of equal parts of pitch and coal tar applied hot to posts, is far more effectual in rendering fence posts durable, in my own estimation, than any chemical antiseptic liquor that has been used for that purpose. A good coat of such materials will protect posts much longer than we are wont to suppose, until we have tested it in a practical manner.

THE TOP END OF TIMBER UP AGAINST TOP END DOWN.

171. Almost every man who has ever set fence posts, and many who have never set a post, will recommend setting them with the *top end* of the wood in the ground, affirming that they will last many years longer than if the butt end was set in the ground. But we have never seen nor heard of a philosophical reason *why* they will last longer, when the top is in the ground, and we never had one atom of confidence in the theory, and we never expect to have, until it has been fairly and honestly shown that the theory is a correct one. It is a most palpable absurdity to affirm that a post will last longer when placed in a reversed position from that in which it grew. This is not the place to show, by extended argument, that the theory is a false one, but those who are anxious to investigate the subject may find an article on this subject from the pen of the author, in the Country Gentleman for 1858, page 323. It is sufficient to say, in this place, that if posts are well seasoned, before they are set in the ground, it will tell, infinitely more on their durability than the position in which they may be placed.

GATES.

172. Figure 69. A gate closes a passage or opens a way to an enclosure, and consists, usually, of a rectangular frame, made of wood or of iron, or of both these materials, and is so adjusted, on hinges, or rollers, that the force of a child can open and close it, at pleasure.



A substantial Farm Gate.

173. The essential, and very important parts of a gate are, a heel post or stile, *a;* figure 69 (inserted at the head of this article), the head or latch stile, *b;* the top bar or arm, *c;* the lower arm, *d;* the slats, or the filling, which extend from the heel stile to the head stile, the stay, or stays, or those pieces which extend across the middle of the gate, vertically, and the struts are those pieces which extend, diagonally, in the direction from the bottom of the heel stile, towards the top of the head stile, *e.* Ties extend from the upper end of the heel stile to the lower end of the head stile, or in that direction. The struts operate as *supports* to

the gate, to keep it in an unchangeable position and shape. The *strut* of the gate operates as a pillar, and the force applied to it is a *compressive* force. The *ties* operate in an opposite direction and sustain the gate by *suspension*. Struts are more effectual in keeping a gate in position and shape, when they are made of wood, than when made of iron, unless they are made of a bar heavy enough not to be bent by the weight of the gate. Ties are more frequently made of wood, in wooden gates, but large wire, with a nut and screw on one end, and a head on the other, makes a tie, which will keep a gate in shape and position as long as the wood remains sound. *Stays* are very important in a gate, and every gate that is long enough to allow a load of grain or of hay, to pass, should have not less than one stay. The slats, frequently, pass through mortises in the stays, but, as a general rule, the stays are nailed, or rivited, or bolted to the slats.

INSTRUCTIONS TO AID IN MAKING A GATE.

174. Every young farmer should learn to make his own gates. It requires but a little mechanical skill to make one, and it will not be any disadvantage to a man to exercise his mechanical faculties in using tools, a little, even if he is abundantly able to hire every such job performed. It cannot be denied that there are a few men in the world who always make a complete *botch* of every job they attempt to do, and the true reason is, they lack the exercise of energy and perseverance. If a man will go to work with a determination to succeed in performing a job well he seldom fails after a few trials. There are thousands of young farmers who could, with the instructions we shall give in this place, make gates for all their fields, and they need only occupy the hours which they squander away in idleness. Come on then, my good friends, and make a gate, and hang it in the place of those bars which you have taken out and put up a hundred and one times during the busy season, and see if you do not detect a smile on your countenance every time you go through it, and listen, and you will, doubtless, hear the proprietor soliloquizing thus: "This is truly more convenient than those old bars. I wonder I did not have one years ago. I shall soon save time and strength enough to make a gate; and more than this, Eddy can open and shut it, and turn away the cows, and bring them up." Don't be disheartened because you cannot make one quite so neatly and quickly as I can. I can make a gate like any one of the cuts given here, and plain it, paint, and hang it in a day, and dig the holes for the posts, and can make six such gates in a week, in a workmanlike manner, and hang them too, and I never had one single word of instruction about any part of the business. If you will make as good a one in two days, we will give you a meed of praise of well done.

175. In the first place have a log of good oak timber for gates, like fig. 69, sawed into stuff, a part three by six inches square, for the heel or hinge stiles, and a part into slats, one by three, and a part into upper arms, *c*, three by six at one end, and three by three at the other end, and have the sawyer saw the upper arms at the mill, like the arm in fig. 69, as far as the

jog in it. At the jog in the arm it should be about three by four inches. The piece that is taken off will make a good head or latch stile. As soon as the timber is sawed out let it be stuck up *very straightly* under shelter where it can season not less than one year. If any of the pieces are sprung after being sawed, if the pile is stuck up straight, put a lot of stones or timber on the pile to bring all the pieces down straight.

176. The next thing will be to have a few tools in order to work with. The planes must be sharpened, after they have been ground, on an oil stone, which will give the irons a fine keen edge. Let the chisels be well sharpened, for it is impossible to make a good mortise with dull chisels. Let the hand-saw be well filed and set. Saw off a piece of scantling for the hinge stile, as long as desirable, and plane off the smoothest and truest side of it, and mark it with a pencil as the *face* side. It is very important to have the face side not only straight, but true, i. e., not winding. Fig. 70 represents a hinge stile laid out ready for mortising; *a* is the face side and *b* the work side. If the face side of the stile should be a little winding, it may be the means of making the whole gate winding. Therefore to ascertain whether the face is winding, lay it on the bench face side up, and lay on the square at one end and the jointer plane at the other end, and look over the edge of the square to the jointer, and if the edges of the square and plane coincide with each other, the face is true. If the face is not true, the mortises will not be true. Apply the try-square and see if the work side is at a right angle with the face. Plane this side straight and true, and mark it. Now with the rule and scratch-awl prick off the spaces for the mortises, and then with the try-square and scratch-awl make marks across the work side, as in the figure. Place the square against the *work side always*, not against the side opposite the work side, and make the marks across the face side of stile, as in the figure. Then from these marks, with the square against the *face side*, draw the marks on the side opposite the work side. Have two points in the gauge just one inch apart. (I would not recommend to purchase a mortise gauge, for they cost too much. A common gauge, costing fifteen or twenty cents, with two steel points for marking, will answer a good purpose.) Run the gauge along against the face side, and mark the sides of the mortises, both on the work side and on the side opposite to the work side. Lay the stile on two benches as high as a man's knees, and have it lay level. One cannot work as well when a stick does not lie level. Bore the mortises half through from each side, and dress the sides of the mortise to the mark. Be careful and not break the wood over the mark. With mallet and *corner* chisel, head down the ends. If the farmer has no corner chisel, let him procure one, for it is worth a score of straight chisels for making mortises. See that the mortises are true clear through the stile. If they should be a little winding, if the tenon is made to fit tightly, the stile will most certainly split when the gate is put together. Now plane out the latch stile, and lay it by the side

Fig. 70. Gate Stile.

of the other stile and lay out the mortises, and see if they correspond with each other. After the mortises are made, bore the holes for the draw pins in the stiles. Half-inch or five-eighths is sufficiently large. Dress out the arm of the gate, having a face side and a work side. Let the face side on the arm be on the face side of the stile, and the work side of the arm upwards. Lay out the tenons with the gauge, and make them a sixteenth of an inch *wider* than the length of the mortise, so that they will be tight when driven in. If the tenons are a trifle *too thick* they will split the stile. Make the tenons on the slats, and have a little shoulder on one edge at each end. See that the tenons on the slats are not too thick, but have them a sixteenth of an inch wider than the mortise. Drive stiles and slats firmly together, and mark the tenons in the holes of the stiles with the bitt. Drive the stiles partly off, and bore the holes in the tenons about a sixteenth of an inch nearer the shoulders than they are in the stile. Give all the tenons a good painting, or smear them with coal tar, and drive them together and pin in, painting the pins when they are driven in. A gate usually decays first in the joints, and if they be well painted, and the draw pins, which should be made of oak or yellow locust, well painted when they are driven in, a gate will last forty years. Put on the stays by cutting a gain on one side of the arm, about half an inch deep, and halve the ends of the stays, and paint the joints, and fasten them with carriage bolts. If it is thought best, lay out the mortises for the slats in the stiles, half an inch on one side of the center, and then make mortises in the under side of the arm two inches deep for the stays. Put small carriage bolts through lower ends of the stays and bottom slat. A wrought nail will answer through the other slats and stays. Let in the strut in the hinge stile and upper arm, by making a gain half an inch deep. Make the strut first, and then mark off the gains, and have it fit tightly. If the upper hinge is not bolted to the arm, as in fig. 69, put not less than three draw pins through the tenon, because there is great strain on this arm, which tends to draw the tenon out, while the strain on the lower arm or slats is inward. I have mentioned the most important considerations in making a gate. Space will not allow me to give all the minutiæ.

HANGING GATES.

177. The first step in hanging a gate of any kind, is to decide how it is desired to have it hung. One must decide whether he will have it hung so as to be opened both ways, or but one way only, and whether it is to be so hung that it will remain at rest at any point which it may pass in opening it; or whether it shall be so adjusted on its hinges, that it will shut of its own accord when it has been opened at any angle, in one-fourth of a circle. Gates may be so hung, that they will immediately open when unlatched, and swing back to a right angle, or they may be hung so as to shut themselves when opened at a right angle. Many farmers seem to think it very important, that a gate should be hung so as to shut of its own accord, while others prefer to have it hung so as to swing open when unlatched, and remain open, and others choose to have a gate hung on an

even balance. Hanging a gate according to one's fancy may sometimes not be practicable, on account of the kind of hinges. With hooks and straps, like figure 71, gates may be hung so as to open or to shut of their own accord, or to remain at rest when opened wide or opened but little. But with such hinges they cannot be opened both ways. With hooks and eyes like figure 72 they may be hung to open both ways, and at the same time they may be hung so as to be self opening or self closing.

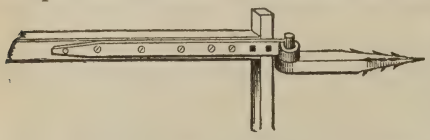


Fig. 71. Style of Gate Hinges called Hooks and Straps.

178. We will now show how the farmer may hang his gates, no matter what may be the style of hinges, so as to suit his wishes. And should one mode of hanging them not seem to coincide with the fancy of his fastidious neighbor, we will lay down rules, which will aid him in hanging his gates to his mind. If Mr. A. wants his gates to swing open as soon as unlatched, exposing his crops, or offering an opportunity to cattle to leave their enclosure, and run away, or to enter on forbidden ground, will he allow me the prerogative to hang my gates, so that they will close *of themselves* rather than swing open when unlatched. Gates are often left open by children and indolent interlopers, wandering about the fields, are frequently too lazy to shut a gate. Therefore, if a gate should, by any means, get unlatched, if it is hung so as to shut itself, it may be the means of saving much damage to a crop, or the running away of animals. Vicious cattle and horses are often rubbing and hooking about gates, and if they happen to unlatch them and they immediately swing open, they are more inclined to try their skill again in opening them. But if a gate is hung on an equal balance, or so as to shut itself, they are obliged to learn not only to unlatch a gate but to push it open before they can pass through. Now, if one unruly animal has succeeded in getting through the gate, if the gate closes after him, the others must necessarily learn the tricks of their leader before they can follow him.

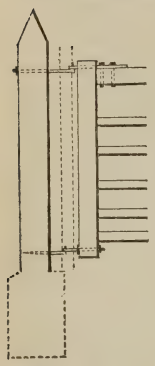


Fig. 72. Mode of hanging a gate so as to be self shutting, when opened either way.

179. It is important that the farmer should understand the *principle* of hanging gates, so as to make them swing any way he may desire, or have them remain at rest, which is nothing more nor less than adjusting the *center of gravity* in the gate. The center of the turning points of the hinges, *i. e.* the center of the hooks and the center of the eyes are the two centers of motion. The whole gate, in swinging, is supported by and revolves around these two points. If now, the higher point of the center of motion is perpendicularly above the lower center of motion, a gate will be hung on an even balance, and will remain in any part of the circle which it describes, in opening and closing. It is no difficult job for a skillful workman to set the posts for a gate by the square rule, and attach the

hinges, doing everything by measuring, so as to have a gate swing as he may desire. But the farmer must first understand the "cut and try" mode of hanging a gate, which is the most practicable, and most generally practiced even by the best workmen.

180. We will run through with the operation of hanging a gate. Set the heel or hinge post firmly (see figure 69, paragraph 172,) with the inside, at least, perpendicularly. (The inside of a post is the side towards the latch post.) If the gate is to be hung with hooks and eyes, like those represented at fig.72, it is best to hang the gate so as to swing both ways. After the heel post is set firmly, strike a perpendicular line on the inside of it. Put the eyes in the heel stile of the gate, square through the stile. If it is desirable to have a gate hung so as to shut itself, the upper *hook* must be about two inches longer than the lower, and the lower *eye* must be about two inches longer than the upper. This subject will be made more intelligible by reference to figure 72, which represents the position of the hinges as just described. It will be readily perceived, that when a gate thus hung is swung around through a quarter of a circle, or more, it will not stand perpendicularly, but is inclined *towards the gateway*. This inclination tends to close the gate. If it is desirable to have a gate swing open itself, all that is necessary is, to *reverse* the hinges, having a long hook at the bottom, and a short one at the top. When a gate is hung in this way, when open at a quarter of a circle, or at a right angle, it will lean *from the gateway*. This inclination tends to keep the gate open.

181. When a gate is hung with hooks and straps, like figure 71, a gate can open but one way, and it may be hung on an even balance, or so as to swing open, or to swing shut. The straps should be bolted first to the gate, and if it is desirable to hang it so as to swing shut, let the lower strap extend beyond the heel stile of the gate, about one and a half inches farther than the top one. Set the gate post, and plumb the inside of it, and also the side of it where the hinges are to be put. After the straps are bolted on the gate, set it up and hold it in the position it is to hang, and bore the holes for the hooks, observing to keep the bitt or auger directly under the eye of the strap. Drive the hooks partly into the post, and hang the gate on, minding to keep the latch end of the gate blocked up, until the hinges are driven clear in. If the farmer would have his gate swing open, let the upper strap on the gate extend beyond the lower one, about an inch and a half. Another way of hanging with hooks and straps, so as to have a gate swing open or shut, is to let both straps extend an equal distance beyond the heel stile of the gate, just as they do when a gate is to be hung on an equal balance. Now, if the gate, when it is being opened, swings to the south, for example, set the heel post leaning to the north about an inch and a half from a perpendicular line. This slight inclination of a post will hardly be perceived by the bystander, and yet, so slight an inclination will close a gate quickly when it is open a quarter of a circle, but when swung beyond a right angle, it will swing back the other

way. In order to have a gate swing *open*, when unlatched, when it is hung as last mentioned, let the heel post lean a little, the way the gate swings open. It will then open at a right angle and there remain, and if swung back through half a circle, it will return again, itself, to a right angle when set free.

182. I have been unusually particular in the preceding paragraphs, in order to show the farmer what is necessary to make a gate swing to his mind which has been hung for a long time and needs righting up a little. If, for instance, a gate has been hung on an equal balance, but will swing open one way and swing shut from the other way, the heel post leans the way the gate swings open, and must be righted up a little, if we would have the gate remain at rest when open or partly closed.

183. It is very desirable to have a gate, when hung with iron hinges, open both ways, and shut itself from both ways; the gate should be hung with hook and eye at the top, as shown at figure 72, and with a forked hinge at the bottom, like figure 73. The forks rest against two staples which are driven into the heel posts, one of which is represented at figure 74. The staples are made of half-inch round iron, about two inches wide and three inches long, and the forked hinge may be made more or less forked or branching. For ordinary purposes the forks should be about four or five inches apart from center to center. When the forks are six inches apart the gate will close itself so rapidly from a right angle as to break the latch, or to split the latch stile when it closes. The true way to hang a gate on such hinges is to put the hinges in the gate stile *first*, and then set the heel post perpendicularly on the inside, and strike a line on the inside of the post, from top to bottom, and having driven the upper hook in the post, in the line, hang on the gate, and drive in the staples at an equal distance from the plumb line on the post. A gate hung in this manner may be made to swing open both ways of itself, by leaning the heel post *from* the gateway far enough to raise the latch end of the gate four or five inches above a horizontal line.

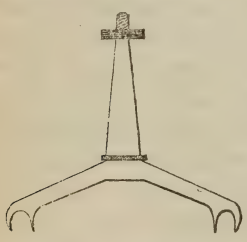


Fig. 73. A Forked Gate-Hinge.

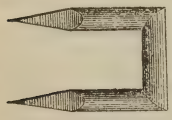


Fig. 74. A Staple for Forked Gate-Hinges.

184. The advantages of the forked hinge over hooks and eyes, or hooks and straps, are, the latch end of the gate, in opening either way a quarter of a circle, *rises* from eight to twelve inches, more or less, according to the length of the gate and the width of the forked hinge, and the distance the hinges are apart. This is a matter of convenience when snow obstructs the gateway, or when the ground on one side of a gate would not allow a gate to be opened horizontally. When a fence runs down a slope, having a gate in it, if the heel or hinge post is set on the upper side of the gateway, the latch end of a gate will rise on being opened, and allow the gate to be opened wider than with any other hinges.

185. Figure 75 represents a cheap wooden gate, with wooden hinges, self-shutting when opened either way. The dotted lines running up and down the heel stile, cutting the center of the upper and lower hinge, which lines should be about two inches asunder, will show how to make the round parts of the stile. The round parts of the stile should be not less than two and a half or three inches in diameter. The bottom eye should be made of a good piece of hard, durable wood, about three by six inches square, and the mortise for receiving it should be not less than three by four inches square and six inches deep, and the tenon of the eye and mortise should be well painted or tarred before the eye is firmly driven in.

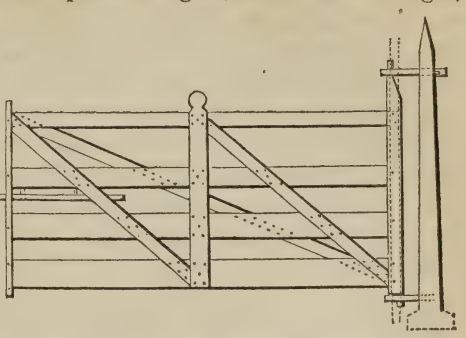


Fig. 75. A Self-shutting Gate with Wooden Hinges.

186. To hang such a gate with the greatest facility and dispatch, drive in the lower hook, and put the hinge post in its hole, and fill it just enough to keep the post erect, and then put the gate on the lower hinge, and drive in the upper eye while it is hooked on the upper end of the stile. Block up the latch end of the gate on a level with the heel end, and plumb the side of the heel stile, keeping it in that position while the hole is filled to the surface. Afterwards set the latch post. Instead of having the lower end of the heel stile made round for a hinge, it may be square on the end, and a piece of three-quarter-inch round iron driven into the lower end of the stile, and passing through the wooden eye which supports the gate. In such a case the wooden eye need not be more than two and a half inches square, but it should always be made of the very best of timber. Always keep wooden hinges well greased. Never put on tar, because it will soon become hard, and wear the hinges more than if nothing were used as a lubricator. This style of gates will correspond well with fences like figures 20 and 23.

187. Figure 76 represents a very neat board gate, to correspond with the style of fence like figure 22. The heel stile is about three by four inches square, and the latch stile two by three square, of oak or other hard and durable timber. The stay may be mortised for the slats, or halved on one side, and a ribbon of a corresponding width fitted to the other side, and bolted with carriage bolts. The struts are one inch by two, neatly fitted, one on each side of the gate, and bolted with carriage bolts. Carriage bolts are much better than rivets, be-because they will draw the struts tighter than rivets, and are more easily put in, and they cost no more, and look much better than rivets; and in case a gate gets broken, it can be readily taken apart, whereas

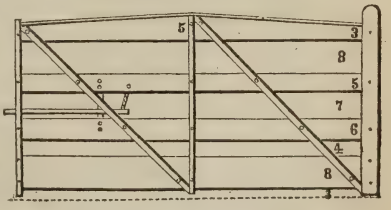


Fig. 76. Carriage-yard Gate, three feet six inches high.

it would be no desirable job to get out a lot of rivets, after they have been firmly put in. The latch plays in a mortise in the latch stile, and is suspended by a little chain near one end. The gate may be from ten to twelve feet long, with boards one inch thick, and widths and spaces as indicated by the figures in the illustration. The tenons should be well painted, and also the surfaces of conjunction between all other parts. The cap board is as wide as the stiles, with the ends let in them about half an inch, as shown in the figure. When such a gate opens into the highway, it looks quite as well to have it hung with hooks and strap hinges, like figure 71.

A STRUT AND PICKET GATE.

188. Figure 77 represents, in the eyes of many people, a very tasty and fanciful style of lawn gate. The heel stile is about two and a half by four or five inches, and the latch stile two and a half by two, and the arms, also, two and a half by two. The bottom board about eight inches wide and three inches below the lower arm. The struts are one inch thick and two and a half wide, and the ends sawed off in a miter box.

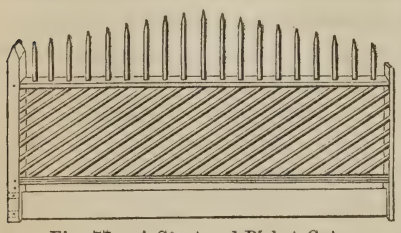


Fig. 77. A Strut and Picket Gate.

In nailing on the struts commence with the shortest one, at the heel stile. The pickets may be of any desirable style, with or without ornamental tops, or the tops may be plain, and tapering to a point, as in the latch end of the gate, about inch and a quarter square, passing through the upper arm, or they may be at the base of them as wide as the arm, and terminate in a point, as shown in the illustration, near the hinge stile. Such a gate ought to be hung with hooks and strap hinges, bolted to the stile and the upper arm. If such a gate is more than nine feet long, there should be a stay bolted to the arms and bottom board, in the middle of the gate. When such a gate is used very often it would be much better to have a double gate, two short ones, than one twelve feet in length. It may be fastened with a latch or hook. It would be well to have an iron tie on a gate of this style, to keep it from sagging, as without one, the arms may bow upwards more or less.

A PICKET GATE FOR A LAWN ENTRANCE.

189. Figure 78 represents a very good style for a picket gate, and it may be made in two parts, or whole, as represented by the cut. The hinge stile is three by four or five inches, the latch stile two by three inches, the arms two by three, and the pickets about an inch and one-fourth square. The arms are about two feet apart, and the longest picket extends twenty inches above the upper arm, and the shortest ones about

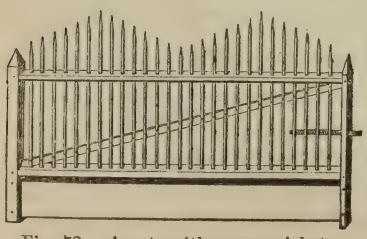


Fig. 78. A gate with square pickets.

eight inches above it. The ends of the stiles are pointed also. The bottom board may be close to the lower arm, or two or three inches below it.

190. In making such a gate make the mortises in the upper arm smooth and true through the arm and dress out the pickets one inch and a fourth square, and point them in the vice, with drawing knife and plane. Drive in the longest one first and then extend a line from the point of it to the point of the stiles, and drive in the others. Let them be dressed so that they will fill the mortise water tight. When they are all in nail them, and saw off the lower ends, and drive on the lower arm, and it will be then ready for the stiles and bottom board. Let the tenons and parts of pickets in the arms be well painted before putting them together. Hang it with hinges which may be bolted to the stile and arms, like figure 71. I have been thus explicit on this gate, because many workmen are at a loss to know how to put it together in the most advantageous manner.

WIRE GATES.

191. Figure 79 represents a wire gate, with the heel or hinge stile and latch stile of wood, upper and lower arms of wood, with the wires passing through the stiles, and the two ends twisted together. The hinge stile should be at least four inches wide, although five inches would be better, and the latch stile should be at least three inches wide, and for ordinary gates, about two and a half thick. Both the upper and lower arms should be tapering, as represented in the illustration, and the deeper, up and down, they are, at the hinge stile, the less liable a gate is to sag. At the other ends of the arms, they need not be more than two and a half inches square. Wire as large as number twelve, well annealed, is sufficiently large for filling between the arms. Two wires are put at one place, and strained, by putting a short rod of iron between them, at the middle of the gate, and turning it over and over until it is sufficiently tight. Before straining them, however, a stiff rail or pole should be placed parallel with the wires, between the stiles, to prevent the wires, when they are being twisted, from springing the latch stile inward. After all the wires are strained this rail may be removed, and the wires will all remain of the same tension. Should any of the wires become a little slack they can be strained a little more, at any time, as two wires when twisted together will not untwist of their own accord.

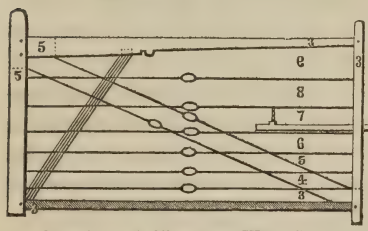


Fig. 79. A Wood and Wire Gate.

AN IRON AND WIRE LAWN GATE.

192. Figure 80 represents a very neat and cheap gate, made entirely of iron and wire, with posts of stone. The posts may be made of small stone, laid up in cement, with hinges for gates, and staples for wires laid in the cement. The hinges should extend entirely through the posts, and the staples, for attaching the wires of a fence, on each side of the gateway

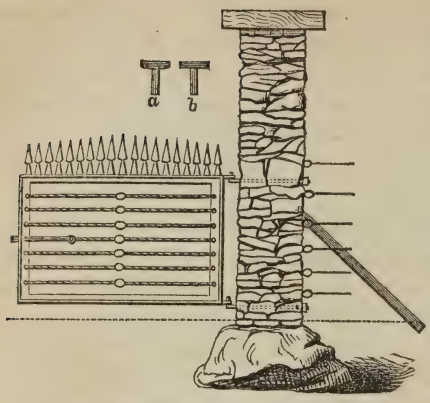


Fig. 80. Iron Lawn Gate with Stone Post.

should also be long enough to reach from side to side of the posts, with the ends bent like a square hook, to prevent their drawing out. The stiles and arms may be of cast or wrought iron, with holes in each side for the wires, which may be put in and strained by twisting them together, as recommended in figure 79. A very light pattern may be made of wood, with both sides of the gate alike, and gates cast after it. Two such gates swinging together may be used to close a drive or carriage way. At *a* and *b* two cross sections of the stiles and arms are shown. The top may be ornamented with pickets of any style, and cast with the gate. The hinges may be also cast with the gate. The pattern for latch stile may be made of stuff inch and a half by three-eighths, and the hinge stile a trifle heavier. The posts should be of very small stone, with the joints pointed, and the top mounted with a square cope stone, with any ornament on the summit of these. Should a wire fence be attached, the post should be most substantially braced, so that the frost would not move the posts by lifting the ends of the braces.

193. Figure 81 represents a very cheap but durable farm gate, which has one quality to recommend it, of which the other gates noticed are destitute, which is, it is adjustable on the hinges, and when snow obstructs the way, it can be raised as high as the top of the hinge post, and fastened there by putting a small iron pin into the round part of the post, under the end of the upper arm. The top end of the post is turned round, not less than three inches in diameter, and instead of passing through the upper arm, a strip of band iron may be bent around it, and bolted to the end of of the arm. The lower hinge is made of a tough piece of hard-wood plank, not less than two inches thick, of a form corresponding to the size of the post, with a gain in one side, as shown at *a*. The lower end of the heel style is fitted to this gain, and the hinge is bolted to the stile, and plays on the outside of the post. A gate hung in this manner will swing entirely round the post. The slats of such a gate may be of narrow boards instead of wire, or pickets may be nailed on the arms. Let the hinges be kept

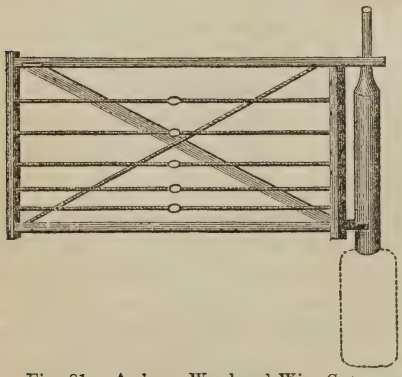


Fig. 81. A cheap Wood and Wire Gate.

well greased. Sometimes an iron pin is put through the end of the arm, into the top of the post, instead of letting the post extend above the gate, as shown in the figure, but the stress at that point is so hard that a small iron pin, if it were not turned smooth, would, in a few years, wear a large hole in the arm. This gate will open either way, and hangs on an even balance at whatever point it may be opened. It may be fastened with a latch or hook.

SELF-SUSTAINING GATEWAY.

194. Figure 82 represents a gateway which some men prefer to all others, because it has many things to recommend it which are not available where nothing but bare posts are used. It is self-sustaining, and may be successfully used in localities where rock lie near the surface of the soil, where it would be impracticable to dig post holes. It may be made as ornamental as desirable, by casing the posts *c c*, and the plate *d*. One gate or two may be hung to the posts, and by having the hooks (hinges) go through the posts, and fasten with nuts and screws on the outside, the hooks can be taken out with facility and put into holes one or two feet higher in the winter when the snow is deep, which is a convenience of no trivial consideration in many localities where snow is liable to drift about the gate. The bedpiece *a* should be of durable timber, and extend on the outside of the posts and braces from the ends to the posts. The sills *b b* should be let into the bedpiece about two inches. The posts need not be more than six inches square, and the plate four by six. The gains, tenons and mortises should all be painted well, or smeared with coal tar. By attaching a piece of plank each post may be used as a straining post for wire fence. The bedpiece *a* may be a round log, flattened a little on the upper side, with the surface not less than three inches above the surface of the ground. The sills should not be set on the ground, but supported with flat stones.

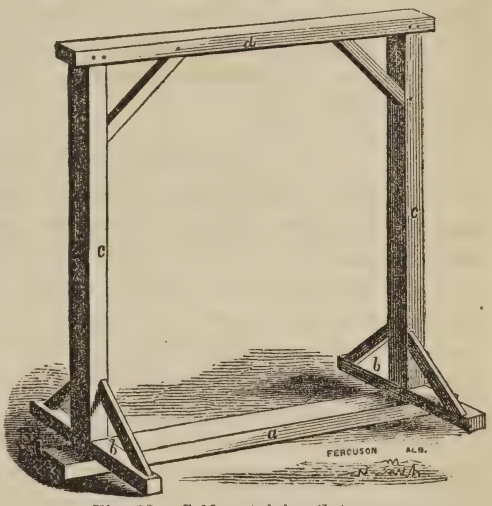


Fig. 82. Self-sustaining Gateway.

RAILWAY GATES.

195. It may be asked why I do not give an illustration of a railway gate, since there are so many different styles of them. If I had ever seen one that I truly admired as economical and convenient, I would not have failed to give a description and illustration of it, but I have never seen one that I liked half as well as a hinge gate, and I never have known one instance where a man had used a railway gate for a few years who did not utterly

dislike it, and wish a good hinge gate were in its place. An illustration of one looks well, and a new gate looks well, and if well made will work well for a few seasons, but if it is used very much the wheels will soon rub hard against the wood, and will make it run hard, and in wet and wintry weather the wheels will be frozen fast, and a man's strength is required to open it, and, more than all else, a railway gate is more expensive than a hinge gate. A good stick of timber, more than enough for two gate posts, is required for the track, and as it is laid near the surface of the ground, it will not last but a few seasons. A man will make and hang a good hinge gate with less timber and less time than a railway gate, and when it is finished it will outlast the railway gate by twice the number of years, and be twice as convenient. A railway gate is always getting off the track, or something else, and the proprietor is always wishing that he had never seen such a vexatious nuisance.

HEDGES FOR FENCE.

196. On the subject of hedges I shall be unusually brief, because, at the present day many writers and experimenters too, of unquestionable authority, pronounce hedges a total failure, while on the contrary, others of equally good authority, speak of them in the most approved terms. It cannot be denied that good hedges have been made in America, and that there are now hundreds of miles of hedges which will turn, effectually, every kind of animal that are allowed to have their liberty on the farm. It is granted that there have been very many total failures, in making a hedge, but the cause of failure could not be attributed to the materials employed, but to the manner of arranging and disposing them, and to the improper treatment which they received, at the time of transplanting, and for a year or two afterwards. The first steps in making a hedge decides the question, whether it will ultimately prove a failure or a success. Because one man has failed in his attempts to make a hedge the beginner should not be deterred from exercising his ingenuity and skill, if he wishes to have a hedge, by endeavoring to produce one that will not disappoint his expectations. Hedges require care and protection and sometimes a little skillful pruning and other treatment, in order to render the plants even, vigorous and strong. There are miles in length of most beautiful hedges, in many of the older States, which have stood for years, as an impassable barrier to every animal that it is desirable to turn on a farm, besides being a most beautiful appendage to a well cultivated farm. And, without doubt, more than an equal number of miles of hedge can be found, which on account of its having received improper treatment and cultivation, during the first years of its growth, stand, not only as a complete failure, but as a nuisance on a farm, and an eye-sore to a skillful farmer.

197. The first step in making a hedge is to prepare the soil where the hedge is to stand. If the soil be wettish it should be thoroughly drained. It would be folly to attempt to grow a hedge in a locality where it would be too wet to raise good winter wheat. But few kinds of trees will flourish well

where there is an excess of water in the soil. If the soil needs a ditch where the hedge is to stand a portion of the distance, or all of it, commence preparing the ground the season previous to planting the hedge, in order to have a deep, well pulverized soil, for the roots to ramify in. The use of the ground need not be lost while the hedge is growing, but it will be an advantage to raise a crop every year, until the hedge is sufficiently large to turn animals. Stake off a strip where a hedge is to be planted, about sixteen feet wide, or wide enough to have, at least, two or three rows of potatoes on each side of the rows of hedge plants. It is better to have the strip unnecessarily wide than to have it too narrow, or so narrow that the ground on each side of the hedge cannot be cultivated with a horse and scarifier of some kind. Commence plowing this land early in the fall. If there is sod on the ground commence in the spring. Plow it four or five times, at least, before winter, throwing the furrows outward at every plowing. This process will produce a deep middle furrow, and the deeper it can be plowed the better. After working the land as deep as is convenient with the plow, make a ditch in the middle so that it would be not less than three feet deep on a level. Tile it or stone it well, having a good outlet for the water. Fill the ditch with dirt and let the whole remain exposed to the influence of the frosts and rains of winter, which will make the whole soil very mellow. This operation is very important, where the soil is inclined to be lumpy during the summer, and where the subsoil is very stubborn. On gravely soils, or on any other soils, where the roots of trees strike deep, readily, where the subsoil has not been pulverized, this operation is not necessary. The operator must exercise his own judgment, whether or not his soil would be improved by such a process. In many localities, such a preparation of soil for a hedge, would be injurious, and a hedge would not flourish as luxuriantly on it as it would have done had the subsoil been allowed to remain untouched. Where a soil can be benefitted by fall plowing, such a preparation is very necessary.

198. On the succeeding spring, as soon as the soil is dry enough to plow, plow this strip of land by turning the furrows inward, at every plowing, until it is six or eight inches higher over the ditch than it is at the sides. Level it with a harrow, and mark out the rows with a plow, and it is ready for the plants.

199. When the soil is not of a uniform quality throughout the whole distance, care and pains should be taken to make it so as far as practicable. In crossing a field forty or fifty rods in width, for instance, a portion of the distance may be a deep, mellow, and very fertile soil, where almost anything would flourish rapidly, while, perhaps, only a few rods from this fertile soil, on a little rise of ground, for a number of rods in length, the soil is very compact, stubborn and barren. When this is the case, a few loads of the good soil should be hauled, and well mingled with the poor soil, before the plowing is finished, and there should be enough spread along on the top to set the plants in. Besides mingling the different kinds of soil, some parts of the land should be well manured, and plowed in at the last

plowing. The idea to be kept in mind is, to have the soil, in the entire distance, as nearly as may be, of a uniform character, so that the hedge will be of a uniform height throughout. If the soil be barren in one place, for a few rods, and very fertile in another place, it will be impracticable to produce a hedge that will be at all beautiful and efficient, for the purpose of turning animals. If the soil is not sufficiently fertile to produce good crops of grain, it should be well manured with chip manure where the soil is compact, if it can be obtained, or with well-rotted barn-yard manure. It would be great folly to transplant a lot of quicks in a soil where they would not make a good growth the first season. It is no uncommon thing to meet with barren spots in fields, that are considered to be in a good state of cultivation, and whenever a hedge is to be made through such a place, it must be plowed and pulverized, and enriched thoroughly, or we may rest assured that in such places hedges will prove a complete failure.

HOW TO OBTAIN THE QUICKS.

200. When a farmer contemplates making a hedge, he should sow the seed in drills in the nursery, in a soil which is not in a better state of cultivation than the soil where the hedge is to be made. If quicks be taken from a nursery where the soil has been manured very highly, and transplanted where the soil is of an inferior character, they will not grow as much in a season, if they grow at all, as if they had been taken from a soil inferior to the soil into which they are now to be transplanted. The practice of taking plants from a rich, well-cultivated soil, and transplanting them into a soil inferior to the one from which they were taken, operates like taking a well-fed animal from his regular allowance of grain and good hay, and compelling him to subsist on straw only. In order to have the quicks grow well, the soil where the hedge is to be planted should be quite as rich, mellow, and fertile as that soil is from which the quicks are taken when they are to be transplanted. For this simple reason the farmer will succeed much better in his attempts to grow a hedge if he sows his own seed and raises his own quicks, than he will to purchase of professional nurserymen, whose grounds are kept in a high state of cultivation by an abundant supply of good manure. Farmers often purchase quicks—and the same thing holds good with fruit trees—of men whose grounds have been made as rich as they could conveniently be made with manure, and although they have transplanted them in the best manner, and have cultivated the soil on which they stand in the most thorough manner, still, during the first season or two, many of them barely live, without growing two inches.

201. Does the beginner ask why not sow the seed where the hedge is to grow? One reason is, the quicks would not be as well protected from cattle, usually, as if they were in the nursery, and another reason is, it would not be as practicable to produce a hedge with the quicks of so uniform size and distance apart from planting the seed, as it would to grow them in a nursery, and then transplant them. Were it not for the fact, that

plants, of almost every kind, when produced from the seed, sown in drills, will in some places be very vigorous while others will not grow as rapidly as they ought to, in order to keep of a uniform size and height, and were it not, also, for the failure of some of the seed to grow, and the liability of the quicks to be of unequal distances apart, and to stand not in a line, as they should, it would be as well to sow the seed where the hedge is to be made. It will, as a general rule, be found to be the most convenient, economical and best, to grow the young plants in a nursery, and transplant them where the hedge is to stand. The soil should be prepared as for carrots or beets, and sowed with a drill or by hand, in rows from thirty to forty inches apart, to suit the proprietor. It is best to have them far enough apart to allow a horse and scarifier to pass between them (see par. 228). In clayey soils, that are inclined to bake over the seed, the drills should be covered with black dirt or mold, fine chip manure, tan bark, saw dust or such like. The seed is usually sown thicker than the quicks should be allowed to stand, and must be thinned out, so as to stand from two to three inches apart. Let them be nursed, and the ground kept clean and mellow about them, and remember that weeds, in some States, will grow four times as fast as the young plants, and if not kept down the plants will soon be smothered.

TAKING UP THE QUICKS.

210. When the young plants are dug up, if dug with a spade, great care should be exercised by the laborers and not mutilate the roots more than can be avoided. When there are many to take up, it can be performed very expeditiously with a plow and team. Let the tops all be cut off within about four inches of the ground with a stiff very sharp grass scythe, (see tools for pruning,) and then, if one has a subsoil plow, let the plow run about eight or ten inches deep, if the roots run as deep as that, on each side of a row, *about eight inches from the row*, and then a third furrow, with the handles of the plow leaning to the left, will loosen all the plants so that they can be taken up with the hands without any spade or mattock. When the roots run very deep, those who raise many thousands of plants have a plow made almost expressly for such a purpose, with a very wide wing to the plow point for the purpose of cutting off the long tap roots; but ordinary farmers may use any plow, and hitch on a strong team to plow up the row, and if half of them or more get covered up, let them be hauled out with manure hooks. After they are all taken up they should be assorted, (see 203,) and no little care should be exercised to keep the roots from being injured by sunshine or drying winds while they are out of the ground. If thought best to take them up in autumn, and to keep them in the cellar during winter, as many prefer to do, the roots should be well covered with sand or loam to keep them from wilting.

ASSORTING THE QUICKS.

203. The object of assorting quicks for a hedge is to have all those of a uniform size planted together. If they be transplanted without any regard to size, with the small ones mingled with the large ones, the large ones will

most certainly overgrow the puny ones, making a weak place in the hedge. There will be many quicks which are not fit to transplant in the hedge row, and which should be rejected as worthless, or left in the nursery to grow another year. If such quicks be planted with others which have strong healthy roots, the roots of the large quicks will spread all around where the roots of the small weak plants should be, thus robbing the small ones of their necessary nourishment; but by transplanting those of a given size together, i. e., those having roots and stems about of an equal size, the hedge will grow up of a uniform size and strength. If, for instance, there are quicks enough in one lot to make a hedge row four or six rods in length, let the smallest ones be set together in the best soil, if there should be any difference in the quality of it, and the largest ones in the poorest locations. Assorting the quicks properly is one of the most important parts of making hedges. It requires the exercise of keen and quick perception, and good discrimination and judgment. In assorting them the operator should select one of the largest and most vigorous quicks in the lot, and lay it by itself. Then select as small a one as is fit to be transplanted. Select one or two, if there be much difference in their sizes, of a size between those already selected. These will answer for a *common standard.* Distribute the quicks, with the large ones by themselves, and the small ones and those of medium size by themselves. One must be guided in assorting not only by the size of the stems alone, but by the size of both roots and stems. Should a small quick have very strong and vigorous roots, it would be better to rank it with those having roots of about an equal size. If a large quick has but few roots, it should not be placed with the large ones because it has a large stem, but it should be placed with those having roots which correspond in size the nearest to it. The operator cannot be too particular in this operation, for not only the beauty and evenness of a hedge depend on a judicious assorting of the quicks, but their efficiency is involved in it. If quicks be transplanted without regard to the foregoing considerations, gaps and weak places in a hedge will surely follow.

TRANSPLANTING THE QUICKS.

204. In the first place, take the plow, adjusted to run about three inches deep, and turn two furrows from each other, where the hedge is to be planted. Next, with a shovel, clean out the trench, three or four inches deep, and wide enough to receive the roots of the largest quicks, when they are fully extended from side to side, without their being bent sideways. The roots should spread out as far as they will reach, and all the little roots and spongioles should be spread out to their full extent, as they originally grew. Cut off all tap roots smoothly, and cut off the ends of those roots that have been mutilated in digging up the plants. Stretch a line about three or four rods long, about an inch on one side of the place where the row is to stand. Have it high enough so as not to be in the way when hauling in the dirt. Let knots be tied in this line, as far apart as the quicks are to be planted. Set each quick about an inch from

the line, at every knot. When two rows are to be planted, the quicks of the second row should be placed opposite the spaces and not opposite to the other plants. When three rows are set out there should be two lines stretched, one for each outside row, and the quicks in the outside rows should stand opposite the spaces in the middle row. When the stems of the quicks are cut off, the line may be stretched where the rows are to stand, and a quick placed under every knot of the line. If the dirt is not mellow and fine in every place, it would be well to have a load hauled by the side of the hedge row, and when one man places the quicks, let another man throw a few shovels full on the roots. Manure should never be applied directly to the roots. A few inches of mellow earth should be applied first, and then manure, and then more dirt, when manure is applied at transplanting. The quicks should never be transplanted, when the soil is too wet to be worked in for other purposes, lest it bake around the roots.

205. When the quicks are all transplanted in a workmanlike manner, the hedge is by no means finished. Indeed, this is but a good beginning. From five to ten years, according to the soil, the kind of plants used, the kind of hedge to be made, and the training and cultivation it receives, will require strict care and protection, to render it an impassable barrier to stock. The first thing will be, if it has not already been decided, to determine what style of hedges shall be adopted, as different styles of hedges require very different treatment.

STYLE OF HEDGES.

206. Hedges may be made to grow in almost any form desired, but, it is always best to imitate nature, as far as convenient and practicable, and, especially, it is best when greater efficiency is secured by adopting a given style. The tops of all trees and plants assume a conical form, more than any other, in their natural state. If some other form for the tops of trees were more desirable, they would, unquestionably, assume that form. But, as a hedge cannot be trained in a conical form, we must adopt the style nearest to it, that of a *pyramid*. The quicks are trained to a single stem, sometimes, for a few feet high, and then the top is sheared in the shape of a pyramid. Sometimes, two or three rows of quicks are transplanted in a hedge row, in which instance they are trained to a thick mat, as it were, from the ground, with sides perpendicular, sometimes, for a few feet high, and then of a pyramidial form, and sometimes, it is trained of a pyramidial form from near the ground to the top. Sometimes the sides are kept perpendicular, and the top is square across, or flat. But this style is considered objectionable by our best hedgers. Sometimes the hedge is trained or sheared in the shape of a sharp pointed egg, with the point upwards. But whatever style may be adopted

207. THE PRUNING AND TRAINING

Must be attended to in a proper season, or one may at once abandon the idea of making an impassable barrier for even small stock. We must not be afraid to cut off a fine growth of sprouts for fear it will require a year

longer for them to attain that height again. Depend upon it this is the most important operation in rearing hedges. The quicks need to be cut off, time after time, in order to give them size and vigor. If they are allowed to grow, from year to year, without being cut down, the hedge will be thin in places and the sprouts will be tall, slim, and easily demolished by animals.

208. In order to make a thick impenetrable hedge, clear to the ground, the quicks standing in three rows, as has been previously stated, should all be cut off, two or three inches from the ground, when they are one or two years old. It is desirable that they should be cut off with some instrument which gives a *drawing cut*, as a crushing cut is very liable to injure the stems. If they grow up again very soon, they should be cut off again, the same season, in the latter part of July, some five or six inches higher than the first cut. At every cutting a thick growth of sprouts is produced, which interlace each other so closely, that it is difficult for a small bird to get through it. If any sprouts shoot off laterally, several inches beyond the majority of the side sprouts, they should be clipped. The sprouts should all be cut off, at least once every year, six or eight inches higher every year, until the hedge is four or five feet high, training the hedge in the form of a pyramid.

209. Another mode of training is, to have but a single row, and not cut off the tops until they are all about two feet high, when the limbs are all interlaced with each other, by hand, and the ends of those which grow at right angles to the hedge row, are sheared off to an even length, making the body of the hedge from two to three feet through. This interlacing the limbs is continued, as the height of the hedge increases from year to year, until it is five or six feet high, when the top is simply pruned in the form of a pyramid.

210. LAYING AND PLASHING.

The operation consists in first removing the thorns and prickles, and cutting away all the needless branches and stems, and leaving straight upright stems in the middle of the row. The best and straightest of these are left for stakes, and their tops are cut off at the height of about four feet. If possible these should be at equal distances of about two feet apart; but as they cannot always be had so regularly distributed, stakes may be driven in the ground to supply their places. The roughest stems are then cut out, and those that are left are bent over to an angle of about forty-five degrees, and a hack is made in them near the surface of the ground. They are then woven backwards and forwards in a slanting direction. When a portion of the hedge is thus treated, long slender sticks are cut and wattled in among the stakes, within an inch or two of the tops, by twisting backwards and forwards, and crossing them on alternate sides of the stakes. The live stakes, in consequence of being surrounded by the hedge, are apt to send out shoots thickly at the tops, and not below, unless prevented by being cut half through at the ground. Strong leather mittens, with long sleeves, are needed by the man who does the work.—*Albany Cultivator.*

211. CULTIVATING THE SOIL ALONG HEDGES

Must be thoroughly performed yearly until the hedge is large enough to turn cattle. The soil should be plowed every spring just as if no hedge was there, and some hoed crop planted by the sides of it. If corn be planted there, a row of potatoes or carrots, beets, turnips, or the like, should be planted on each side of the hedge between the corn and it, never nearer to it than three feet. Let a horse scarifier be run along the hedge row as often as you can find leisure during summer, and keep the ground mellow and level and free from grass and weeds during the entire growing season. Never allow any kind of plants to cast their seed near the hedge row. If weeds or thistles are allowed to grow among the quicks, they will soon choke them and produce a thin weak place in the hedge. If some parts of the hedge do not seem to grow as fast as others, give the small parts of stinted growth a liberal dressing of well rotted chip manure or sawdust, or well prepared compost, and work it in with a hoe. If the soil in places seems to be so hard that they do not grow as fast as other parts of the hedge, let mellow dirt be spread on each side two or three inches deep. There will be a great many times during the growing season when for an hour or two, and perhaps for half a day, the work hands will have nothing which they can do advantageously. Let all such leisure hours be occupied with a hoe at the hedge. Let the farmer keep an eye on the hedge and see that it is not neglected in autumn, and that a lot of weeds do not go to seed, so as to keep one weeding for seven years. Remember that.

212. 'One year's seeding makes seven years' weeding." Never think of making an impenetrable hedge in less than a decade of years when only a little strip two feet wide on each side of the hedge is scratched over a little once or twice a year. If land is cheap, and it is no object to cultivate a crop by the side of a hedge, let the work of cultivating be performed with plow, harrow and cultivator without a crop. Another thing which is too commonly neglected, is

213. PROTECTING HEDGES FROM CATTLE

While they are too small to protect themselves. Young steers, especially, and bulls delight to plunge into a hedge row to hook; and horses and sheep like to nip off the tender shoots, and if it is not protected by a good fence, it is all folly to attempt to grow a hedge. Nor should we delay to fence a hedge row for the first year or two, for cattle are very liable at any time to get on forbidden ground, when they would quickly make irreparable breaches in it. Should there be no sheep kept on the farm, the expense of protecting a hedge would be trifling. A fence on each side of it, like fig. 12, even if the posts were not of the most durable timber, would subserve a good purpose until the hedge were strong enough to turn cattle without any protection. It is always advisable to keep cattle away from hedges until there can be no risk in permitting them to hook into it to their satisfaction.

REPAIRING HEDGES.

214. Should a breach be made in a hedge, or should it become so thin and weak in places as not to be strong enough to turn cattle, if the stems are not healthy, it would be best to remove them entirely for a few feet in length and commence anew with young quicks; or, if thought best, the stems should all be cut off a few inches from the ground, when new sprouts will spring up, which must be treated like a new hedge until the gap is securely closed. Wherever thin spots occur in a hedge, it is a pretty sure indication that the soil is not as fertile as it should have been made previous to transplanting, or that roots of the quicks were mutilated, or that they did not have an equal chance with the rest of the hedge.

HEDGES FOR WET GROUNDS.

215. It is frequently the case, that lands on the borders of rivers and lakes, which are liable to inundation in the spring and in autumn, are so wet, that none but aquatic plants would flourish well there. In such localities an impenetrable hedge may be made, in a very few years, with the branches of the yellow willow, or of any other kind of trees, the limbs of which will take root when stuck in the ground. The limbs should all be cut of a uniform length, say five or six feet long, *with a saw*, as an ax is very liable to split and sliver the ends. The upper ends should be *sawed* off slanting, for a slanting cut will heal over more readily than a square cut. The lower ends should not be sharpened by cutting off the wood all around them, because the ends will be very apt to rot as far up as the bark is all taken off, and sometimes further, endangering the life of the plants. But the sharpening should all be done on one side of the limbs, and then roots will start from the ends, and a portion of the lower ends will not decay. Take the limb in one hand, when it is to be sharpened, and set it on a block, and make a clean slanting cut, only on one side. Limbs that are less than two inches in diameter, should not be sharpened at all, because they will take root all round, better than if they were sharpened. Let limbs of a uniform size be planted together, and never stick small ones and large ones indiscriminately together, lest the large ones overgrow the small ones. Let all the branches remain on them for interlacing, except such as grow on the parts which are to be below the surface of the soil.

216. In sticking them draw a line and make the holes with a crowbar, directly under the line, about ten or twelve inches apart. For large limbs let large holes be made, and for small ones do not make the holes so large and deep, that the limbs will extend down so deep that the lower ends will all decay. If they are planted ten or twelve inches deep, unless the soil is very deep, they will flourish better than if they were planted twenty or more inches deep. Plunge them in the holes to the desired depth, with the hands, and never drive them. If, then, any of them do not seem to stand sufficiently firm, place a good sod on each side of them, and stamp it down well. After the limbs are all stuck let the branches on them be interlaced, by commencing at the bottom, and weaving them, back and

forth, forming a kind of lattice work. Should the whole seem not to stand very firmly, let long slender branches from the trees, of some other kind of wood, be interwoven at the tops, as represented in figure 83. Such a hedge should be made early in the spring in preference to the fall, and it will require shearing, at least once a year, to keep it even and to prevent its growing too high.

WHAT KIND OF PLANTS ARE USED FOR HEDGES.

217. The selection of suitable plants for hedges depends, in a very great degree upon the locality. In some localities, one kind of plants will flourish very luxuriantly and make the best of hedges, while only a few hundred miles distant from such location, that kind of plants will not succeed at all in hedge making. Some species of plants are not at all adapted to the climate, where they are to be used, while some others which flourish well in a given climate, are so liable to be attacked by the borer or blight, as to be of no value whatever, for hedges. The English hawthorn, for example, has been found entirely unsuited to most parts of the United States.—[*Albany Cultivator.*] Some plants do not seem to be hardy enough to endure, without injury, the extreme cold of our northern winters, and such plants, although they may have a great reputation for making hedges in some localities, should be tested with caution, where any doubts are entertained of their success.

218. In searching for information in regard to hedges in the agricultural journals of the present day, the farmer will be puzzled beyond measure to know what to do in regard to making a hedge of any kind. One article, penned by a man who professes to have been successful in making hedges, will state, in most unequivocal language, that "every farmer may raise hedges." Another writer of very reliable authority, will assert, with the strongest confidence, that it is by no means practicable for American farmers to make hedges, with a view of enclosing and dividing their fields, which shall be cattle proof. One writer will recommend a certain plant for hedges, with the most confident assurance that it will ultimately be universally adopted for fencing the western prairies, where timber is not abundant, and that such a plant succeeds for hedges remarkably well, while on the contrary, another man will declare, most positively, that such a plant can never make a good hedge, and that he will defy the world to produce a solitary instance, where an efficient and impenetrable hedge has been made of that kind of plant. Amidst such a conflict of opinions on a subject so free from doubt and uncertainty, the farmer must exercise a little good common sense and let the bugbears and sharks go to the winds that brought them.

219. It cannot be denied that there are miles in length of the most efficient and impenetrable hedge, in nearly every State in the Union, through which an American bison could not pass, and which has been produced with but a small degree of expense and care. And if a few enterprising farmers have succeeded in making a good hedge, the arguments and assertion against hedges, of a man who has failed to produce a good hedge from utter

neglect or from local causes, should have no influence in deterring the farmer from making a hedge, if he desire one.

RED CEDAR FOR HEDGES.

220. The red cedar is acknowledged by the most reliable authority to be one of the best plants in America for both ornamental and field hedges. It has more desirable qualities to recommend it than any other known plant which is used for making hedges. If it only bore thorns it would be incomparably better for hedges than any other plant whose merits have been thoroughly tested as a hedge plant. It is extremely hard and adapts itself both barren and fertile soils, although it flourishes on a rich soil as much well to better as any other plant, and it attains a great age, is as highly ornamental as the most fastidious can desire, and is not liable to blight or winter kill, or to be injured by insects. No other plant bears shearing any better or with less injury than the red cedar, and a hedge of this kind of plants may be sheared into almost any form with great facility.

221. The best mode of obtaining the young plants is to gather the berries, or seed, as late in autumn as possible, before the ground freezes, and sow them in drills, covered about one inch deep with some very light mellow earth. But few seeds will vegetate the first season, but if the soil be kept well cultivated, and free from noxious weeds during the growing season, the second season they will appear in abundance. If the soil be deep, mellow and rich, they will grow from one to two feet in height the first season; if the soil is rather poor, and the little quicks are obliged to grow or die among weeds, if they grow six inches high the first season it will be all that can be expected. The plants should be thinned out when they stand too thick, and transplanted in rows for a year or two. When they are from two to three feet high they should be planted out for hedges, in soil prepared as recommended, as early in the spring as it will answer to work in the soil. If they are set in only one row they should be not less than twenty inches apart, and if in two rows two feet apart, with the plants of one row opposite to the spaces of the other row. Let all the limbs on all the insides of the trees be interlaced as neatly as may be, and let the limbs on the sides of the hedge row be sheared to a uniform length, from six to twelve inches in length, according to the length of the limbs. During the first and second season, or, perhaps, longer if necessary, let the tops be sheared of a uniform height. As the hedge grows higher let the inside limbs be interwoven from tree to tree, backwards and forwards, and do not fail to keep the soil well cultivated on both sides of the hedge row, for at least six or eight feet on each side. If everything is performed in a workmanlike manner, a complete lattice-work, impenetrable by any domesticated animal, will be formed in a few years.

222. As the red cedar bears no thorns, and as cattle are so much inclined to hook and thrust about in evergreen plants, the red cedar may, upon trial, succeed better, by training the young trees to bare stems about four feet

high, and then allow the tops to branch out, so as to be sheared in the form of a pyramid, or in the shape of an egg, with the little end upwards. In this style of training the inside limbs should be interlaced, from a point four feet above the ground to the top of the hedge.

223. A little good skill and judgment, and the exercise of a little common sense, are indispensably requisite in pruning the young cedars. If the trees are two or three feet high it will not answer to cut off all the limbs the first season, and leave but a little bush at the top. The first season that they are transplanted in the hedge row, the lower limbs, for about six inches along the bottom of the stems, may be cut close with a sharp knife, and if the limbs above this point be more than a foot long, the ends may be clipped off to a foot in length on each side. The next spring trim off the limbs a few inches higher, close to the stems. If the plants have grown six inches or more in height, it may answer, if there is an abundance of limbs, to cut off smoothly all the limbs for six inches more. The growth of the plants upwards will usually determine how much of the limbs may be cut off below in one season.

THE YELLOW AND HONEY LOCUST FOR HEDGES.

224. The yellow locust and honey locust are indigenous in the United States, and flourish luxuriantly in almost every locality where there is not an excess of water in the soil where they are planted. They are among the most beautiful ornamental trees, and when in full bloom the yellow locust seems most delightful. Both of the kinds already mentioned are very hardy and great feeders, the roots of the yellow locust growing to almost an incredible length in one season. The honey locust bears bunches of long and sharp thorns, from two to three inches in length, presenting such an ugly appearance as to deter almost any animal, man not excepted, from climbing up into it; but the thorns of the yellow locust are small and short, and deciduous on the main stem and limbs of the trees when they are a few years old. The honey locust is said to be a very common tree in the forests of some of the western States, and when found on rich bottom lands it attains a growth equal in height to most other trees which surround it, The timber of the honey locust is somewhat hard and rather porous, and is sometimes made use of for cabinet purposes, and sometimes for posts and rails for building fences. The timber of the yellow locust of thrifty trees is remarkably tough and firm, and durable when exposed to the influences of the weather. On account of its excellence in resisting the action of moisture, it is used in preference to almost any other timber for pins and wedges, and such like, in ship building. For fence posts it is not inferior in point of durability to white oak, and for carriage hubs it is not inferior to the best of birch. In some localities the yellow locusts have been entirely destroyed by the ravages of the borer and the large green caterpillar. But the borer seldom attacks any other part of the tree excepting the body for six or eight feet from the ground. But if the epidermis or dead part

of the bark be all scraped off or shaved off to the live bark once in four or five years, or as often as any signs of the borer are discovered, and the bodies of the trees smeared with a daubing made of three parts of pitch or rosin, and one part of tallow, melted together, and applied warm with a brush, the borer will be most effectually excluded.

225. Neither the yellow locust or honey locust have been tested satisfactorily for hedging purposes. It has been used to a limited extent in a few instances, and there are at the present day many young hedges of both kinds which promise to be in a few years most impenetrable barriers against any kind of stock. I am able to discover no good reason why the locust may not be used most successfully for hedges, with proper treatment and care. It grows quickly even on poor soils; is easily propagated; bears shearing extremely well, and is very tenacious of life. The locust will probably succeed better when planted in a single row and plashed, than in two or three rows and trained in a *mat* hedge. The locust flourishes best solitary; and when the art of hedge making shall arrive to greater perfection, the locust will rank among the first plants for hedges.

226. Both kinds of locust bears seed contained in long pods, which may be gathered late in autumn and kept in a dry apartment until the succeeding spring, when, to insure their vegetation, the seed is put in a vessel of some kind and boiling hot water is poured on them while they are stirred lively for a few moments, and then allowed to remain in the water for a day and a night, when most of them will be swollen to twice their original size. All such seed is sure to grow if planted in a soil that will produce good corn, and covered about as corn is covered when planted. Those seeds which have not swollen during the operation should be treated in the same manner the second time. The object of scalding the seeds is to soften the hard and tough skin which envelopes the germ, so that moisture can enter the seed. If the seed is planted as soon as it has arrived to maturity early in autumn, before the skin on them becomes so dry and tough, most of them will vegetate in the succeeding spring, when they may be treated as has been recommended.

THE OSAGE ORANGE FOR HEDGES.

227. The Osage orange, a cut of which is here shown (taken from Albany Cultivator), has been used extensively for hedges, so that its success is no longer attended with doubt. It is found wild in Arkansas, Mexico, Mississippi and some other States, where it grows from twenty to thirty feet high. It flourishes well in most of the States and Territories, and with proper treatment has never failed to make an impenetrable hedge. Many failures have been reported respecting the Osage for hedges, but in all probability the failures could be traced to improper management, such as neglecting to shear down, and to keep the soil in good condition, or assorting the quicks and transplanting them properly. We need apprehend no failure in making a first rate hedge of the Osage, if the course is strictly followed which has been marked out in the preceding pages.

We copy from the American Farmers' Encyclopedia the following description of the Osage orange: "It is very branching, each branch being armed with numerous sharp thorns. The wood is remarkably tough and solid. The male and female flowers are on separate trees. The fertile, or female tree, bears fruit abundantly in a few years. These are round and rough, and greenish colored, resembling somewhat an orange, and weighing from twelve to eighteen ounces, containing from one hundred to one hundred and fifty seeds."

228. The best manner for any one to obtain the quicks for hedges is to procure the seed in some locality where the Osage flourishes in a wild state, and sow them in autumn in well-prepared ground. The seeds, like many other kind of seed, will vegetate better after having been exposed to the frosts of winter in the soil. It is said that there are about eight thousand seeds in one quart, and that they may be obtained in Arkansas for the mere expense of gathering them. When they are obtained of nurserymen the cost is from two to four dollars per quart. It is recommended by some farmers to scald the seeds of the Osage in the spring, at the time of planting them. Hedges made of the Osage orange require trimming twice a year, and some, who have experimented with it extensively, say that three trimmings are necessary in one season. The farmer must exercise a little judgment with reference to trimming a hedge. Should the growth be small, it would not be proper to cut off as much as if there were a very great growth.

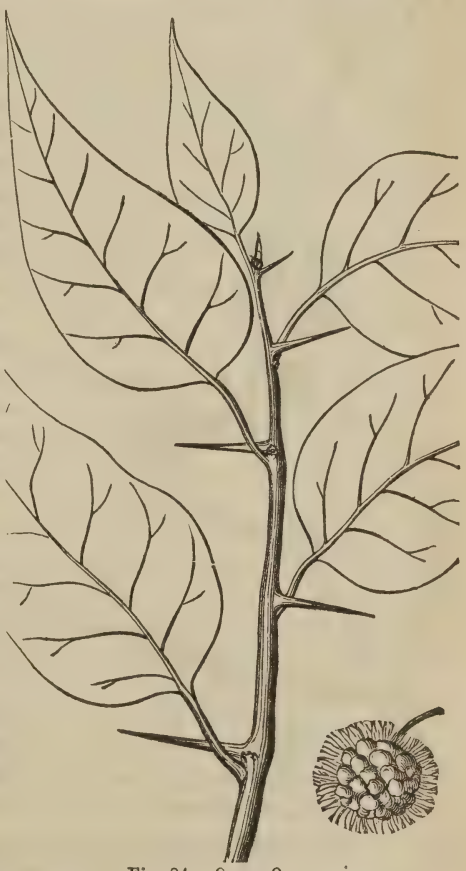


Fig. 84. Osage Orange.

BUCKTHORN FOR HEDGES.

229. The buckthorn is pronounced by some writers to be the most suitable plant for hedges that can be found in the United States. It makes an efficient and impenetrable hedge when properly treated, and grows very rapidly, is very hardy, and almost entirely exempt from disease, and from the attacks of insects. There are hedges of the buckthorn in some of the

older States, which have subserved the purpose of an impenetrable fence for more than forty years, and are now free from gaps and weak places. The buckthorn bears pruning very extensively without any apparent injury, and is never injured by the most intense cold of winter. It vegetates early in the spring, and does not cast off its verdure until late in autumn.

Fig. 85. Buckthorn.

230. The figure here shown represents a branch of the buckthorn. The seed may be sowed early in autumn in mellow soil, covered about one inch deep, when most of them will vegetate the next spring, if the seed is good. It is best to have at least two rows, or three, in a hedge row of buckthorn, and train them by shearing down, so that the hedge will be an impenetrable mat clear to the ground.

There are several other kinds of thorns, such as the Washington, Newcastle, Hawthorn, and some others, which have been used for hedges, and sometimes successfully, but they are so liable to be affected by blight, or insects, or something else, which is very injurious to them, that it is not safe, except in few localities, to experiment with them. The various kinds of thorn are propagated by gathering the haws, or seed, and divesting them of the skin and pulpy matter, and sowing them in the fall, so that they may freeze and thaw during the winter.

RECAPITULATION AND GENERAL REMARKS.

231. After the farmer has fully concluded to raise a hedge, let him secure *good seed*, which is generally distinguished from an inferior quality of seed, by its weight. Poor seed is, usually, rather light and feels dry to the touch, while good, plump, bright and heavy seed seems to be colder, when handled, than it really is. Let all seed that is more than one year old, be rejected, and none but new seed sown. Bear in mind, that as seed advances in age, it looses its vitality. Seed is, many times, injured, and often the vitality is entirely destroyed in preparing it for use. The pulpy

matter which encircles the seed, is usually removed by placing them where they will rot, gradually, and afterwards washing the pulpy substance from the seed, and then by spreading out the seed where they will dry. But they should not be allowed to become too dry, as that will injure the germ. If they are permitted to lie, while rotting, in piles so large, or deep, that they will heat and mold, the germs of such seed will be liable to be destroyed. I must be allowed to insist that it is important that every farmer grow his own quicks, on soil of about the same quality of that where the hedge is to stand.

232. When the quicks are cut off in autumn it would be a good practice to have a vessel of equal parts of melted pitch, or resin (rosin) and tallow, and smear the ends with it, applied with a paint brush. The most expeditious mode of doing it would be, to hold as many in one hand as is convenient and then apply the brush. Even after the quicks have been transplanted, a man with a small brush would smear the ends of a long row in a few hours. It would not be practicable to perform such an operation after the first shearing, or cutting down, on account of the great number of stubs, although such an application will be found very useful in preventing the stumps from drying and cracking, to the injury of the quicks. Any instrument, in pruning, shearing, or slashing, which cuts the stems square off, with a *crushing*, instead of a *drawing* stroke, or cut, is quite apt to shiver the butts or stumps of the quicks, so that they will not heal as readily as if they had been cut with a *slanting* and *drawing* cut.

233. On the subject of pruning too much care cannot be taken, for rules and practices which would be all important for raising an efficient hedge in one locality, would be very deleterious to a hedge in another region. In some regions the sprouts of the Osage orange grow so rapidly as to attain the height of four to seven feet in one season, while in other places they would not grow as many inches. Where they grow so rapidly the roots become proportionally strong, and shearing must be resorted to. But when the growth is very small, and the stems slender and weakly, it might be the wisest policy to allow them to grow unmolested for one season. It is not easy for one to tell, with pen and ink alone, whether a hedge should or should not be cut down, at a certain stage of its growth. Sometimes it might be very advisable to trim or shear a hedge twice in one season. But the probability is that in our climate it is best to clip but once a year, and the best and most natural season for this operation would seem to be *in the spring*. I know many recommend late autumn, and others the month of July, for this purpose, as being the best, but it appears to me, that unless the ends of the quicks are smeared with something to prevent the weather from drying them, it would be best to do it in the spring, about the time the buds begin to enlarge a little. If some of the quicks grow too rapid during the summer, the top ends may be pinched off a little. This will check the tendency to shoot upwards tall and slim, and will tend to enlarge the stem and side branches. If it is desirable to have limbs clear to the ground, the side branches should not be clipped

until they have grown, laterally, not less than two feet, on each side of the row. In order to have the branches low, the quicks must be clipped near the ground the first time they are cut off. If they are clipped high the first time it will be impossible to produce limbs near the ground unless the whole top is cut down, when, if the roots are strong and healthy, many sprouts will start from the stumps, both upwards and horizontally.

234. Hedges oftener prove a failure in consequence of *neglect* than from any other cause. Hedges cannot grow, they will not grow, and those who expect them to flourish well *among weeds and grass* will be most certainly disappointed. The soil, on each side, must be kept loose, mellow and clean, for at least half a rod from the hedge row. When only a narrow strip of two feet or so, on each side, is scratched over occasionally, it would be no more beneficial in many localities, than if the soil were not broken at all. On prairies and bottom lands, where the soil is deep, always mellow, and fertile, preparing the soil as recommended, 197, is not so very important, as on stubborn, clayey, and calcareous soils, in which localities, the directions should be followed up to the very letter.

235. I have never, as yet, met with any writings in which it was recommended to transplant the quicks as recommended in 204. The more usual practice is to dibble them in with a kind of paddle, or to thrust in a spade where a quick is to be set, and thrusting the handle forward, the quick is set behind the spade in a wedge-shaped hole, without any spreading of the roots. But it seems to me that if it would pay in transplanting fruit trees, which none will deny, to spread out the roots, it would be time profitably spent, in transplanting the quicks for a hedge in the most workmanlike manner. According to the modus operandi in 204, a long line of hedge could be put out in a day, by a faithful laborer and a small lad, and in such soil as we find, for the most part, in central and western New York, and in some of the New England States, no one who is acquainted with their character and manner of working them, in the most proper manner, will wish to deny that this is the better mode of transplanting the quicks. It is most certain that the more the roots of a tree or quick are spread out, in transplanting, the better the tree is transplanted, and the more they are crowded into a small compass, the less liable they are to flourish luxuriantly for the first year or two after transplanting. If a quick has side roots, nature and common sense teach us that it is better to spread them and extend them their full length, than to double them and crowd them into a small hole.

236. The proper distances for plants to be set is a very important question in growing a good hedge. For my own part, I am fully persuaded that hedgers, as a general rule, plant too close. It is a most common fault in transplanting all kinds of fruit trees to plant too close together, and, although *very* close planting is recommended on good authority for hedges, it is my candid conviction that if those hedgers who advocate and adhere to very close planting, and who succeed well in raising efficient hedges when planted *very* close together, would plant the quicks farther apart

they would meet with still better success than they do in very close planting. No one will deny that quicks for hedges may be planted too closely together, and we all acknowledge, without any argument, that it is not difficult, in the least, to plant them too far apart. Now then, if there is a point, beyond which, in one direction, it may be said the quicks are too near together, and, in the opposite direction, they are too far apart, that is the point which will determine, most accurately, the most proper distance apart for transplanting the quicks, in order to make the best and most efficient hedge. The distance that might properly be called close planting, when one kind of plants is used, might not be said to be too close for another plant. The kind of plants used always should, in a great measure, determine the proper distance for the plants to be set apart. We consider eight inches apart too close for any plants, and for any style of hedge, although some hedgers advocate a distance of only *four* and *six* inches apart. But when plants are set so very close together the shoots are very apt to be small and slender, with not sufficient space for the lateral branches to attain suitable size for consistent strength; and more than all else besides, when they are crowded so closely together they are quite liable to die, in consequence of being deprived, by those on each side of them, of their necessary nourishment at the roots. We consider *one foot sufficiently close for any plants in a hedge row*, and for some plants one foot apart is just twice as close as they should be. When plants are set closer than one foot, or even one foot, let a few plants be placed in a row, at such distances apart, and see how little space they have for branching out. Look, for example, at the sprouts around stumps, which stand very close to each other. They are tall, slim, and not half as strong as they would be if they were not half as numerous, and more than all else, their lateral branches, if there are any at all, are very slender and will very soon decay, whereas, if the plants stood twenty or thirty inches apart, the lateral branches—which give the greatest efficiency to a hedge—will be large, strong, and not liable to premature decay, as in close planting. It is better to have one strong, healthy, lateral branch, than three, or even four, branches in the same space, which are slender and liable to decay, in consequence of close planting. Strong, stiff, lateral branches, with the ends clipped off, and having thorns on their sides, are very repulsive, troublesome things for stock of any kind to plunge into. But when all the sprouts grow erect, and slender and smooth, bullocks with very long horns will delight in the fun of thrashing them to the ground. Any one who is well acquainted with the habits of the red cedar or the hemlock, or American arborvitæ, will, I doubt not, fully coincide with me, that when planted very close together they could not be relied upon for making an efficient and impassable hedge, but if transplanted at about thirty inches distant, they will make, in some localities, a more efficient and impassible and *durable* hedge, than any other plant which has as yet been successfully cultivated for hedges. Of these three plants, last mentioned, the red

cedar is most preferable. The honey locust, the yellow locust, the Osage orange, and, in fact, almost every other plant which has been and is now cultivated for hedges, will flourish best when standing nearly or quite solitary ; therefore, to close this subject, we lay it down as our candid conviction, that all the plants just mentioned will flourish better, be more durable, be stronger, less liable to premature decay, be trained with less difficulty, make an impassable fence sooner, be kept within the desired limits assigned for the width and height of the hedge, after the hedge is completed, and be grown at a much less expense, and by laborers possessing inferior skill in the business of hedging, when the plants are set from sixteen to twenty inches apart, in some instances thirty inches, than if they were set from six to twelve inches apart. I have planted some red cedars for a hedge fence, and I place them thirty inches apart, believing that at that distance they will make a better hedge than if set any closer to each other.

Since penning the preceding thoughts on hedges, I have read "Warder's Hedges and Evergreens," a most useful treatise for every one who ever contemplates raising ten rods of hedge. When I penned this article on hedges, I did not know that such a book was in existence, and am much gratified to learn that our views on the subjects connected with hedging should coincide so well, especially in regard to the distance apart at which the quicks should be set. I have to acknowledge, with gratitude, my indebtedness to the *Country Gentleman* and *Albany Cultivator*, published by Luther Tucker & Son, for some of the ideas in composing this chapter. When anything has been copied due credit has been given.

THE PRINCIPAL TOOLS FOR FENCING.

237. It is a trite but usually true maxim, that "a workman is known by the *chips* he makes and by the *tools* he uses." A good workman, as a general rule, will not work with poor and awkward tools, because it is bad policy. He knows that with poor tools he is required to exert much more physical strength in doing a given job, and that he makes little progress, and many times cannot do a piece of work in any other than a very inefficient manner. Some men *always* use poor tools. A good tool of any kind with them is the *exception*, and not the *rule*, and if they chance to get a good tool, it is of short duration, for it is soon broken or stove up, or injured in some manner, so that it is a poor one. On the contrary, other men will always keep their tools good until they are worn out, and one will seldom find a poor tool in their possession. Good tools many times cost no more than poor ones in dollars and cents, and the loss sustained by using poor tools would often amount to more than enough *in dollars and cents* to purchase good ones. It will not be denied by the great majority of workmen, that a laborer will be able to do twice as much in a given period of time, with less force and fatigue to his powers, with a good tool, than with a poor one, and many times the difference is even four or five times in favor of good tools. The best of tools are often rendered no better than

very poor ones, by neglecting to keep them in good order, and they are often allowed to be used in that unworkmanlike condition, because those who use them do not know how to keep them in good order. And good tools are often very much damaged by neglecting to take care of and keep them from the influence of the weather. This leads me to speak of

THE USE AND CARE OF TOOLS.

238. It is not always those who break and wear out the greatest number of tools who perform the most labor, but to the opposite of this; for those who are in the habit of damaging, staving up, and breaking the most tools, are usually those who do a very limited portion of labor. One-half of the laborers, yes, more than that proportion, do not seem to think but that they may pry and lift with a spade, shovel or hoe handle, as they would with a crowbar or hand-spike. For this reason the handles of both spades and shovels become so badly sprung, if they are not broken, as to render them very inefficient and almost worthless. The beginner should learn to exercise a little judgment in regard to the strength of the materials of which tools are made, and to protect them from the injurious influences of wet and dry weather, which will rust, warp, distort, and rot them, to their injury more than all the wear of them when in actual service.

THE FENCE TOOL RACK.

239. When laborers are digging post holes, it becomes necessary to use several different tools at various times in digging one hole, and when there is nothing to lean them against, a workman will spend a portion of his time in picking up his tools and changing them; and in some places where the surface of the ground is covered with mud and water, tools will be falling into the mud, and then a laborer must spend time to wipe off the mud. All these little points of time will soon consume time enough to dig a hole or two. A workman needs all his tools close by his side, where he can lay his hand on them without stepping away from his work. To aid him in having his tools all at hand, and for keeping them out of the mud, a tool rack, fig. 86, is a very important implement in fence building, It should be made very light, so that one will not dread to move it when necessary. *A* is a piece of scantling two inches square and two feet long; *b* is a light board one foot wide and two feet long, screwed to the sills; *c c* are standards, round, two feet long and one inch in diameter; *d d* are guard pins one foot long and one inch in diameter, standing at an obtuse angle with the part *A*, for keeping the tools, as they stand on the platform *b*, from falling on the ground. On this platform should be kept the shovel and spade, the auger and spud, the crowbar and spoon, and the rammer, and then no time will be spent in picking them out of the mud; and it should be borne in mind that this little light bench is not strong enough to use as a heavy saw bench.

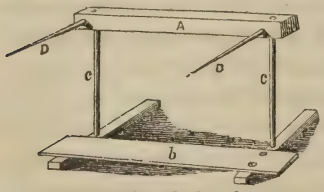


Fig. 86. Tool rack.

THE POST HOLE AUGER.

240. Fig. 87 (see page 477) is an illustration of a dirt auger, which is a very useful tool in digging ordinary holes for fence, and when the stones are all so small that they will pass between the lips, a workman can bore a hole three times quicker than he can dig it with other tools. When the ground is very wet, one can make a hole three feet deep in less than five minutes, should the auger not hit any stone. When there are many stones they must be taken out by hand. But few men know how to use such an auger. Many will insist on having a large screw on the end to draw it into the ground; but such a thing would be impracticable, because the threads of a screw would immediately clog with dirt and be worse than a small plain point, such as they should always be made with. In using such an auger, dig a foot or so with the spade, and then with the crowbar make a hole six or eight inches deep for the point of the auger to turn in, if the ground is hard. When the ground is soft a hole made with the crowbar will not be necessary. Bore in six inches, and with the rammer pack the dirt *a little* on the auger, so that when the auger is lifted out it will bring all the dirt with it. In dry dirt, if it is not rammed a little on the auger it will fall back into the hole when the auger is taken out. Make a hole with the crowbar again, and bore as before. Have a little paddle at hand to clean off the auger when the dirt adheres to it. Never strike an auger on a stone for the purpose of knocking off the dirt. It should be kept so bright that dirt will seldom stick to the lips. Bear in mind that a post auger is not a crowbar nor a sledge, and when made as light as it ought to be, it can be easily broken. When the lips hit a stone in boring, let the auger be taken out and pry out the stone with the crowbar.

241. *Description.*—*a* is the handle, two feet long, which passes through an eye in the shank *b*, which shank is made of three-fourths of an inch round iron, about three feet long, screwed into the socket of the auger. *c c* are the cutters or lips, which are all socket, lips and point, which point cannot be seen, cast in one piece. The lips at *d* are from two to one and a half inches apart, according to the size of the auger, although two inches is large enough in the widest place. The lips should not be more than one-fourth of an inch in thickness, tapering to the edges, which should be chilled when they are cast. The point should not be more than two inches in diameter, terminating with a point, about three or four inches long, made of a true round taper. As such augers are seldom kept on hand, and where they are kept for sale the price is from $3 to $4.00, the farmer can employ an experienced pattern maker to make the pattern, and he can get such an auger fitted up at a machine shop for about one dollar and fifty cents, handle and all. Treman Brothers, of Ithaca, sell them ready for use at $1,25. The whole of the boring portion should be kept as bright and smooth as a plow, and never allowed to become rusty. When not in use it should be washed and wiped clean and dry, and kept where it will not rust, because, if it becomes rusty it will not work well, any more than a plow that is not scoured so bright that the dirt will slip in plowing.

THE SPUD.

242. For digging post holes, a spud, figure 88, is many times the most convenient and efficient tool that can be used. Where there are but few stone, and the earth is too hard to spade it up, a spud is very useful. In digging holes twice as large as the dirt auger will bore, the spud is brought into use, and with it the sides of the holes are cut down and dressed twice as quick and twice as easy, as it could be done with spade or crowbar. For digging up the earth in the bottom of post holes, when no dirt auger is used, a spud is far better than a crowbar. Any good blacksmith can make a spud, and the cost will be from $1,50 to $2,50, according to the size and weight of it.

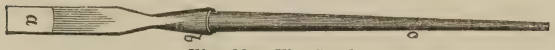


Fig. 88. The Spud.

243. *Description.—a* is the blade from two and a half to three inches wide, and about half an inch thick, and a foot long, and of the best of iron, and the edge or lower end of the blade, for two or three inches, all steel, properly tempered for cutting stone and gravel. The edge is beveled from both sides like a crowbar. *b* is the socket, large enough to receive a handle two inches in diameter and not less than four inches deep. The handle *c* should be round and tapering and made of the toughest and firmest timber. If it is two inches in diameter at the socket, it will be of a fair proportion, if it is made of a true taper to the upper end, which should be about one inch and an eighth in diameter. The whole tool is about six feet in length. Remember that a spud is not made to *pry* or *lift* with, like a hand spike, but to cleave off the dirt, and to dig it up, so that it can be taken out of the holes with the dirt spoon. Let the edge be made as thin as will be consistent with sufficient strength. If it is too thin it will soon break or bend.

THE RAMMER.

244. The rammer (fig. 89,) is used for packing the earth firmly around posts. In using it workmen are too apt to pack the dirt close around the posts and leave much of it untouched with the rammer. The dirt should be well rammed from the post to every side of the hole. The rammer should be about five feet in length. The large part of it should be about four inches in diameter, and twenty inches long, and the lower end mounted with an iron plate over the end, and a good band around it, to keep it from splitting. It should be made of heavy, durable wood. The upper end of the knob need not be but one inch in diameter. Rammers are often made by boring a hole in a piece of scantling and putting in a handle. But a turned one is a little neater. A handle may be turned of the proper size, and driven firmly in the head, after which the head may be turned. Recollect that a rammer is not a tool to *pry* with, nor *to strike sideways* with.

THE CROWBAR.

245. Here (see fig. 90,) we have something that you do not break, and stave up, without some extra exertion. This is not a shovel, lift with it as heavily as you please! It is not a spade, pry with it till you are tired! It is not an ax halve, nor fork handle. And now, friend, you who are always breaking and staving up tools, that were never designed to pry with, when you have anything to pry, get the crowbar. A crowbar is a very useful tool, and its efficiency depends in a great measure on its form and size. For ordinary purposes on the farm, a crowbar of the following dimensions is of a fair proportion and good form and size, and as small as one ought to be. For handling heavy stone, crowbars may be heavier than this, but never lighter. It is better, for general purposes, to have the basil from *a* to the edge tapering like a wedge, instead of being pointed. From *a* to the edge, four inches, made of steel, and tempered as hard as it can well be and not break when punching on stone. From *a* to *b*, eight inches, and one and three-eighths inches square. From *b* to the upper end, which is about one inch in diameter, round, it should be of a true taper. From *b* to *c* it is twenty inches, with the corners hammered, as in the figure. From *c* to the end, from thirty to thirty-four inches, round and smooth. The upper end should be laid with steel, so that it will not become battered up in hammering or driving stone with it. Let the edge of the crowbar be kept sharp, and it will not be difficult to work a hole in almost any soil.

246. The most efficient and proper manner of using a crowbar when making holes in the ground is, to clasp it with both hands close together, when it stands perpendicularly before the workman, with the hands about as high as the elbows, and then lift it, perpendicularly, and plunge it down perpendicularly. By handling it in this way, it is easy to thrust it straight in a hole, at every thrust. But when a man attempts to make a hole by taking hold of the crowbar as he would hold of a pitch fork or spade, he finds it very difficult to thrust twice in one place. In digging up the earth in the bottom of a post hole, with a crowbar or spud, first make a hole three or four inches deep, in the center of the post hole, and then thrust in the bar about three inches from this hole, and pry the dirt towards the center of the post hole. Let the dirt be loosened all over the bottom of the hole, and then take it out with

THE DIRT SPOON.

247. A dirt spoon (figure 92) is not calculated to shovel dirt nor to spade with, its office is to scoop out the loose dirt, in digging post holes. It is better for such a purpose than a spade or any kind of shovel, because it is not so pointed as some shovels, and has a deeper bowl, like a scoop shovel. They are seldom made to hang correctly, and the bowl is usually too long to do good work. The bowl is frequently made in a straight line with the handle, whereas, there should be so much hang to it, that when it is full of dirt, there will be no tendency to turn over

in the hands of a workman. (See shovels.) There should be so much hang (see hang,) or crook to it, that in filling it with dirt, it must be carried to the opposite side of the post hole from where the digger is standing, and then crowded down into the dirt, not by thrusting but by the weight of the operator, and as it enters the dirt it should be carried back to the other side of the hole. Figure 93 represents a side view of the dirt spoon, by which it will be seen what is about the correct shape, for the bowl and crook of the handle. Our old fashioned ladles for scooping boiled beans from the dinner pot, comes the nearest to a dirt spoon of any other implement, and when a ladle hangs correctly for dipping beans out of a dinner pot, it may be used as a model for making a post or dirt spoon. The handle of the dirt spoon may be of wood, and bent like a shovel handle, or the spoon may have an iron shank a foot or so in length, bent in proper shape, like figure 93. Let the bowl be kept bright so that dirt will not adhere to it, and clean it with a little paddle instead of striking it on a stone or block to knock the dirt off. When it is struck on a stone to clean the dirt off of it, the edges will soon become all stove up, and the dirt will not slip off readily.

Fig. 93. Side view of Dirt Spoon.

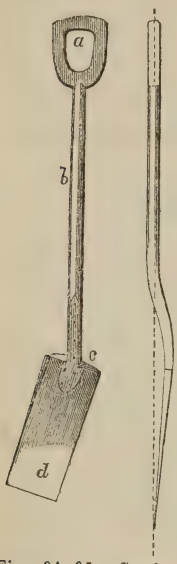
THE PLUMB RULE.

248. The plumb rule, figure 91, is made of a strip of board about four feet long and three inches wide, and scolloped, or forked at the bottom, as in the figure, so that it may rest on the points, while the plumb *c* swings freely. The rule must be planed as straight as can be with the jointer, with the edges parallel, and a mark made with the gauge along the center, as at the dotted line *a*; *b* is a screw to which the plumb line *d* is attached; *c* is the plumb, made of lead, about two inches long and one inch in diameter. To make a plumb, bore a smooth hole in a hard stick of wood, and fill it with melted lead; as soon as the lead is poured in, hold a little wire staple in the melted lead, with the pinchers, until the lead becomes solid. Split the stick, and attach the plumb by the staple, to a piece of small cord *d*. Place the edge of the rule against the side of a post, and if it is plumb the cord will hang exactly over the dotted line *a*. Such a rule is usually quite as convenient as a *spirit level and plumb*, which will cost ten times more, and it is often far more correct, and will show any slight variation with more accuracy than many spirit rules.

Fig. 91. Plumb Rule.

THE SPADE.

249. Figure 94 respresents a good spade, in one sense, but because it hangs so awkwardly it is worthless. It would be almost impossible to spade with such a tool, because there is no hang to it. The names of the principal parts of the spade are, *b* the handle, *a* the hilt, *c* is the stamp, or shoulder, *d* is the blade. Figure 95 shows a side view of a well hung spade. It will be discovered that a line cutting the middle of the straight portion of the handle will strike the edge of the blade, as shown by the dotted line, and the upper end of the blade should set *back* of this line about two inches in a spade about a foot long. When the blade hangs in such a position that a line cutting the center of it would be parallel with a line cutting the straight part of the handle (see fig. 97 of shovels), it will not work easily, because the laborer will be obliged to make an extra effort to prevent a spadeful from slipping off the end of the blade. When a spade has as much hang as a well hung shovel, a spader is obliged to reach forward with the handle so far that the motion is awkward, inefficient, and not easy. But when a spade has about as much hang as is shown at figure 95, a workman is not obliged to use up any of his energies in an inefficient manner. It is much better to have a spade-handle entirely straight, without any hang at all in a spade, than to have the edge and the blade stand at such an angle as is represented by figure 94. A spade with a handle entirely straight, and straight with the blade, is not an awkward tool to spade with until one attempts to lift a spadeful, then we shall see distinctly the necessity of having a spade hung in the most proper manner. Manufacturers would do well to make two kinds of spades, one kind very neat and light, but sufficiently strong for skillful laborers, and another kind unnecessarily heavy and clumsy, for the special benefit of those stupid dolts who use a spade as if it were a crowbar, and who cannot use a spade a half day without bending the blade, or breaking or springing the handle, or staving it up into some undesirable shape.



Figs. 94, 95. Spade.

250. In using a spade, especially in spading sod, the operator should always remember to cut a spadeful loose on both sides before it is thrust in to take up a spadefull. When a spade is thrust in its whole length into hard soil, and the force of a laborer applied to the handle to loosen the spadeful as if it were a lever, if it is not made too heavy and clumsy, for a skillful laborer, it must break or bend, so as to be unfit for use. In spading we cannot avail ourselves of any advantage by resting the handle across one knee, as in shoveling, therefore a spade should not be one ounce heavier than is necessary for consistent strength. The blade should be made of steel, because a steel blade is much stiffer than an iron blade of the same

thickness. A man, whose mind is enlightened with a knowledge of mechanical principles, will never bend nor break a spade; his keen perception will tell him, even if he were blindfolded, when the strength of the spade is unequal to the force applied to the handle.

251. In spading the soil in gardens, when a plow is not used, the laborer takes a spade-slice, six or eight inches wide, and spades clear across a given plot of ground, leaving a furrow about half as wide as the furrow made by a plow. The narrower the spade slices are the more completely the soil will be pulverized. When manure is worked into the soil in spading, it should be spread in the furrow, and every spadeful turned upside down on the top of it, and if the dirt does not all fall to pieces, a thrust or two with the edge will pulverize it sufficiently for raking. When spading soil of a clayey or adhesive character, after the spade has been thrust in, instead of prying the spadeful loose, by prying down on the handle, the laborer should thrust the handle *from him*, *forward*, so as to loosen the spadeful. This operation will not require half the force for spading that is necessary where the spading is all done by prying down on the handle to loosen the spadeful. A skillful spader will *wear out* his spade, but an awkward Jonathan will *break* and *stave up* twice as many spades, and will not perform half the amount of labor as he who handles a spade with a little skill. In spading in ditches where the soil is quite wet, ninety-nine diggers in one hundred will put their whole weight on a spade-handle in order to pry a spadeful loose, whereas, if they would loosen it by thrusting the handle forward, it would not require one-fourth the strength, and it would be loosened in less than half the time. By prying down on the handle to loosen a spadeful where there is water, a spadeful is not easily pryed loose, because in separating the spadeful from the unbroken ground there is a tendency to form a vacuum; but by thrusting the handle *forward* enough to loosen the spadeful, air and water will find their way behind the spadeful, and it may be easily lifted from its place with the spade. *Remember that a spade is not a crowbar nor handspike.* If the edge and blade of a spade are made of steel, as they should be, and polished on the grindstone, and the edge ground up sharp, if the edge has a good temper, so hard that it will not batter when it touches stone, nor break when thrust on a flint, it will not require much force to drive in the spade when spading. But when the edge is all battered up, and towards one-fourth of an inch thick, spading is a very laborious operation. A good steel spade should never be allowed to become rusty, nor to be exposed to heavy rains, as bent handles in spades are quite apt to spring straight, when left in wet places. A few drops of oil will keep the blade from rusting, and it will not require half as much time to clean a spade and oil it, and put it under cover, as it will to scour it fit for use after it has become rusty. If the edge of a steel spade is too soft it may easily be tempered again as hard as may be desired by heating about two inches of the edge.

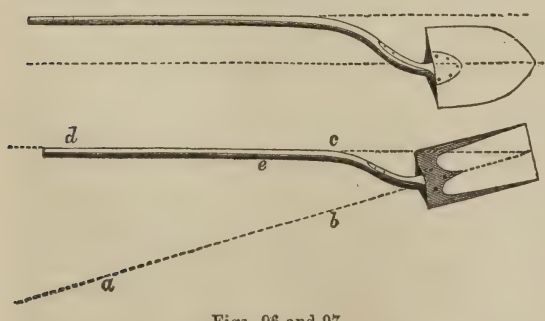
SHOVELS.

252. The great excellency and efficiency of shovels, and the ease with which they may be handled, depend almost entirely on the correct hang of the handles and blades. If a shovel or spade be made of the very best materials, and is defective in the hang of the blade and handle, it is a poor tool, and the intelligent farmer would find it for his interest to dispose of such tools to those who seem to contend that a laborer can perform just as much work with a tool having a straight handle as with a tool correctly hung, *providing he is only accustomed to using* such tools. Shoveling dirt or manure, or anything else, is very laborious work, even when the very best kind of shovels are used; but when shovelling is to be performed with a poor tool, the laborer is sure to be greatly fatigued while he performs but a light day's work; but when a shovel is made of good materials, is light and bright, and correctly hung, a man will be able to perform twice the amount of labor, with half the fatigue, that he would experience with a shovel improperly hung. Shovels are too frequently made unnecessarily heavy in order to be of consistent strength, because the materials of which they are made are very poor; but if they were made of good steel, they might be often full one-third lighter, and sufficiently strong for any skillful laborer to use without fear of breaking. When the blades are made of poor iron, it is necessary to make them nearly twice as heavy as if they were made of steel; and, more than this, iron blades will not wear as smooth, and will not enter the dirt as easily as a steel blade; and dirt is far more apt to adhere to an iron blade than to a steel one, all of which require the exercise of more force in using a shovel. It is no uncommon thing to find shovels from one to two pounds heavier than is necessary. Suppose, for example, a laborer will throw up ten shovelfuls in a minute, and at the same rate he will throw up six thousand shovelfuls in a day of ten hours. If his shovel be two pounds heavier than is necessary, he will in ten hours exert a force, which is entirely lost in handling a heavy shovel, which would be sufficient to have thrown up twelve thousand pounds of earth with no more fatigue than he experiences had he used a lighter shovel. The laborer will discover from this fact the importance of having shovels as light as will be consistent with necessary strength, and the better the materials are of which shovels are made, the ligbter they may be, and the more a workman will be able to perform with a certain amount of force. In using a shovel, all the force which a laborer exerts should be turned to the most efficient purpose. It does not require but little force to shovel a ton of earth when a man handles a good shovel with dexterity; but if a laborer must bend his legs and back very much in order to bring his shovel in the best position to enter the substance to be shoveled, with the least force, the fatigue produced by bringing his body into such a position, and straightening up again, will be greater than that caused by thrusting in the shovel and lifting a shovelful. For this reason it is very poor policy for a laborer to use a shovel with a very short handle, like the handle of a spade, for shoveling any

length of time, because it is very laborious and fatiguing. A man may shovel with a short handle for an hour or so as fast as he would with a long handle, and not discover any difference in the fatigue produced or force expended; but let him continue to use a shovel with a short handle all day, and if he does an honest day's work, unless his powers of endurance are very great, he will pronounce shoveling very laborious business. In shoveling dirt or manure with a short handled shovel, the operator usually places the hand which holds the hilt of the shovel against the inside of one thigh, and bends his knees and body forward, and in this position, by no means an easy one, thrusts in the shovel. The simple act of bringing the body into such a position, and bringing it again erect, will require the expenditure of more force than the shoveling alone. In order to shovel with the least fatigue, a laborer needs to stand almost erect, with his back straight and knees bent but little, and then with the handle resting across one knee, the shovel is thrust into the dirt by a forward motion of the body; and by straightening the knees and keeping the arms stiff, with the shovel across the knee, the shovelful is lifted a few inches with the least possible fatigue. Then, by making a fulcrum of the knee, across which the handle is resting, and by thrusting the upper end of the handle down with one hand, the shovelful may be raised nearly a foot high with the greatest ease. It must then be lifted by the arms. But a man's back should be always kept about straight in shoveling, as he will be able to work much longer and with less fatigue than would be possible when he is constantly bending and straightening his back. The knees should always perform the most laborious part in shoveling dirt, and the arms should be kept as closely to the body as is convenient. My apology for being so particular on this subject is, few laborers, old or young, know how to use a dirt shovel with the greatest ease, and to perform the greatest amount of labor with the least fatigue; and they often labor very hard and accomplish but little, because they do not understand handling the shovel with dexterity, or because it is not properly hung. I shall now treat more particularly of

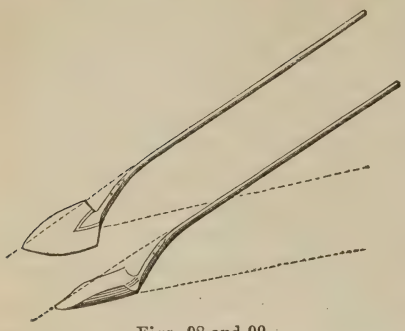
THE RULE FOR HANGING SHOVELS IN A WORKMANLIKE MANNER.

253. Figures 96, 97, 98 and 99 represent shovels well hung, and the dotted lines show the angle at which the straight part of the handle and the blade should stand with each other, in order to have a shovel hang in such a manner as to work easily. When a man takes such a shovel in his hands, across one knee, as if he were about to shovel dirt, the blade should lie nearly flat on the ground, on a



Figs. 96 and 97.

level with his feet. This will be readily comprehended by the dotted lines.



Figs. 98 and 99.

Every laborer who knows how to handle a dirt shovel with dexterity, knows that the blade of a shovel must lie nearly flat on the ground in order to enter the dirt with the least force of the operator. In fig. 96, for example, the dotted line, *a b*, represents the level on which the laborer stands. The blade lies flat on this level. One hand of the workman grasps the handle at *c*, and the other hand at *d*, while the handle rests across one knee at *e*. Now by a slight motion of the body forward, the shovel is thrust in with the least possible force, and by the motions then of straightening up and thrusting down the hand at *d*, as already mentioned, shoveling is performed with as little fatigue and force of a laborer as it is possible to do it. With a shovel hung like fig. 96, a laborer can avail himself of some mechanical advantage in shoveling; whereas, with a shovel exactly like it, which has a short handle like the handle of a spade, one hand must not only lift much more than a shovelful, but it must operate as a fulcrum for the other hand to pry across so as to balance the shovelful. A shovel like fig. 96 is not designed to be used in ditching or shoveling up ridges along a fence, because it is so wide at the extending edge that twice as much force is required to make it enter the dirt as is required for a shovel like fig. 98 of the same width. For shoveling sand or mortar, or for cleaning stables and such like, a shovel like fig. 96 is preferable to one like fig. 98, which represents a round pointed ditching shovel, or the best kind of a shovel for casting up a ridge along a fence. Fig. 99 represents a round pointed shovel similar to fig. 98, with the sides turned up by a blacksmith, for working in a narrow channel or ditch. Figs. 96, 98 and 99 are all hung alike, as will be seen by the dotted lines, and hung according to the most approved mechanical principles. A shovel that hangs just right for a tall man, will not hang exactly right for a short man, when they both grasp the handle at the same places; but a short man, by grasping the handle nearer the blade, may use a shovel that hangs just right for a tall man, and vice versa.

254. Figure 97 represents a round pointed shovel, very awkwardly hung, and it would be a very disagreeable and ugly tool to work with. There is curvature enough in the handle, but it will be seen by the dotted lines that the straight part of the handle, and the blade of the shovel, are in lines parallel with each other. Whereas, if the point of it stood at the upper dotted line, as in the other figures, it would be a good shovel, and a laborer would be able to shovel with it with as much ease as he would with one hung like figure 98. With a shovel like figure 97, a laborer must bend his whole body very low, in order to bring the blade in a position to enter

the dirt, by the application of the least force. If he attempts to shovel with it across one knee the blade stands up and down at such a sharp angle that it is difficult to keep a shovelful of dirt on it, and more than this, a laborer cannot thrust it into the dirt unless he stamps it with his foot, except the dirt is very mellow. Shovels are never made of this shape by skillful workmen, but by allowing them to be exposed to the influences of wet and dry weather, and by *prying* with them, and other *rough* and *hard* usage, shovels that are correctly hung are often brought into a shape like figure 97 before they are one quarter worn out. The handles of such shovels ought to be made of timber having a natural crook, not bent, and then there would be little liability to spring out straight. Let the blades of shovels be kept bright by wiping them dry after using them, and applying a few drops of oil, *not salted grease*, as many do, for salt will rust iron, and keep the handles near the blade well painted, and never use a shovel for *spading* nor *prying*, for it is not a spade nor a hand spike. When a shovel is used to spade with, the almost certain consequence is, that the blade will be bent directly across the middle. What has been penned holds equally good with reference to the hanging of scoop shovels, and of forks for pitching manure.

BOOT IRON FOR SPADING.

255. In spading or shoveling when it is necessary to stamp the spade into the dirt with one foot, the shoulder of the spade or shovel would, in a short time, wear the sole of a boot entirely through, besides making the foot tender or lame. To obviate all such occurrences, a boot iron, figure 100, is used for the purpose of protecting the boot, and for giving efficiency to the force of the laborer. *a* is the sole of it, made of iron, about three-sixteenths of an inch thick, as long as the boot it wide, and about two inches in width from the flange *e* to the forward edge of the iron at *a*. At *b* is one of the ears through which the leather strap *c* passes; *d* is a buckle in one end of the strap. The ears are a part of the sole iron, turned up, from two to three inches long, according to the size of the boot. The flange *e* is turned downwards, like a hook, to prevent the shoulder of the spade from slipping off of it. The iron is placed in the hollow of the boot, with the flange *e* against the forward side of the heel of the boot, and the strap *c* is passed behind the heel, and through mortises in each ear, as shown in the figure, and buckled around the instep. An ingenious blacksmith will make the iron for ten or twelve cents, and the strap and buckle will cost eight or ten more. This is a very useful article in using the spade, and will save the wear of boots very much more than its cost.

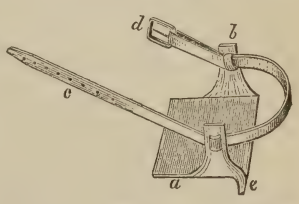


Fig. 100. Boot Iron for Spading.

THE RAIL FENCE JACK.

256. In repairing rail fence it is often necessary and desirable to put in a good rail near the bottom of a fence, where a rail is broken or rotten, without taking down the corners. When there are heavy riders on a fence, and the stakes are firmly set, it is no little task to take off the riders and loosen the stakes, and let down the corners, in order to take out old pieces of a rail, and replace a good one there. But by having a fence jack like figure 101, a man or boy can raise the corners of a fence, when it is staked and ridered with heavy rails, and take out the pieces and put in a good rail much quicker than he would be able to do it by taking the fence down and putting it up again. It is so plain that almost any one can make it. *a* is the sill, about thirty inches long, of good timber, two by four inches square. *b* is the standard, about three and a half feet long, five inches wide, one and a quarter inches thick, with three-quarter holes bored in it, about four inches apart. *c* is the lever of tough timber, not less than three inches square at the mortise, where it plays on the standard. The mortise should be so long that the lever can play up and down freely. The short end of the lever should be six or seven inches longer than the end of the sill, and scolloped, as in the illustration, to prevent its slipping off the rails. The other end should be about six feet long, and of a true taper from the mortise to the end. The end need not be larger than a fork handle. *d* is an iron pin with an eye in the end, attached to the lever *c* by a small chain or leather strap. The pin is for holding the lever at the holes in the standard, for prying across. *e* is a pawl, attached to the handle, and plays in the notches in the standard *b*. In using the jack for lifting the corners of the fence, put the end of the lever under a rail and raise the corner a little, and put a stone or block of wood between the rails to keep them apart. Now carry the jack to the next corner and raise it up a little, and fasten the lever with the pawl, and then take out the pieces of the rail and put in a good one, and let the fence down again. When it is desirable to raise the corners of a fence so as to put larger blocks under them, the fence jack is much more convenient than a handspike, because one hand can work with it, very advantageously, while with nothing but a handspike two hands are very necessary. If the end of the lever on which the rail rests extends too far beyond the end of the sill, the jack will tip over when a corner is resting on it. To obviate this difficulty run the end of the lever under the rails so far, that the weight of the fence will not be beyond the end of the sill. If the rails should be close to the ground, raise them a little and block them up and then set the jack a little under the fence. Such a jack is a very convenient implement for raising one end of the axle-trees of a wagon, when the wheels are to be taken off. The notches for the

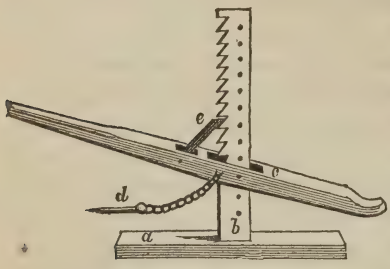


Fig. 101. A Rail Fence Jack.

pawl should not be quite as close together as they appear in the illustration. It would be a great improvement to have an *iron rack*—a straight piece of iron with teeth on one side of it, bolted to the standard, and an iron pawl playing in it, but for ordinary purposes, notches in a wooden standard and a tough piece of wood for a pawl will subserve a very good purpose.

257. A MATTOCK OR GRUBBING HOE

Is a very useful tool for setting stakes for a rail fence, when the stakes are not driven in the ground in a perpendicular position. The blade of a mattock should be not less than two and a half inches wide, and the handle should be of an oval form instead of round, so that a laborer can hold it more advantageously in the proper position when using it. When the handle of a mattock is round, a tool may turn half way over in the hands of a workman and he will not perceive it, but when a handle is of an oval form, the eye also being oval, a workman will perceive a slight variation of the mattock without looking to see if he is holding it correctly. (See Hammer and Beetle.) The handle of a mattock should always be put through the eye from the lower side, and then it will not draw or work out, if the eye is made as it should be—a little the largest on the lower side. Remember that a mattock or grubbing hoe is not a crowbar for prying stone, nor a mill pick for dressing stone. Neither the handle or blade are calculated for prying. I give no illustration of a mattock, because it does not seem necessary, as they are usually manufactured about of the right size and form. Mattocks and picks of all forms may be seen in the illustrated catalogue of R. L. Allen & Co., New York city. For digging up trees, and for setting fence stakes among roots, one edge of the mattock should be in the form of an ax, for the purpose of cutting roots and sprouts. For ditching, or for picking up very hard dirt, a pick with a pointed end, instead of an edge like a mattock, is much the best.

SPOOL FOR CHALK LINE AND FENCE LINE.

258. The majority of farmers, if they have any chalk line at all—and the same is true of many good mechanics—wind it up on a corn cob or a stick of wood, notwithstanding the very great inconvenience in letting a line off, and the injury it receives by being wound up and let off *over the end* of whatever it is wound up on. Many mechanics have a little pocket spool to wind the line on, and let it off by holding it, as it revolves, with a thumb at one end and a finger at the other. It is a fact which but very few people understand, that in winding up a line or cord, or rope of any kind, by putting it over the end of the stick, or spool, if it is wound up the same way it was twisted when it was made, it will be twisted harder and harder every time it is wound up, and will soon curl up, running into all sorts of kinks and loops, while, on the contrary, if it be wound up in an opposite direction, it will soon be all *untwisted* and nearly worthless. I have seen many good lines completely spoiled in this manner, by being always wound up one way, and then let off by allowing the spool to revolve

When a line is wound up over the end of a stick, and let off over the end, it does not injure it, providing it is wound up the way that will twist it harder as it is wound up. If it is twisted harder by winding up, and untwisted by letting it off, just as much as it was twisted, the line will remain in the same condition if wound up few or many times, but when it is wound up in the contrary direction, which will untwist it, as it is wound up, it will not, generally, twist it as hard as it ought to be twisted by simply allowing it to run off. These few ideas will enable the farmer to understand and to appreciate the importance of having a spool like figure 102. It will be discovered by the cut that there are three flanges to this spool, which are about four inches in diameter, and two inches between them. A half-inch hole is bored through the spool, and it revolves easily on the part of the handle which passes through it, which should be made of very tough wood. In letting off the line let the workman, as one hand grasps the handle, apply the thumb against one flange of the spool to keep it from unwinding too rapidly, and in winding it up let the spool be turned by taking hold of the wristpin, or little handle, in one flange. By letting a line off such a spool, and by winding it up without passing it over the end of the spool, it will never become untwisted, nor twisted so hard that it will curl into kinks, and a line will last much longer when kept on such a spool than it will when kept on a corn cob or a stick, and more than all besides, it is infinitely more convenient. A chalk line is kept in one gain and a fence line in the other. To keep the other from unwinding when one is being let off, cut a gash in each flange with a saw about three-sixteenths of an inch deep, and after the lines are wound up draw the ends into these gashes. Always have a loop in the end of each line, for hooking on a scratchawl or pin.

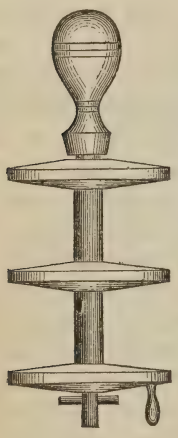


Fig. 102.
Spool for Chalk Line.

259. *When chalking the line* the line should not be allowed to run across a lump of chalk, cutting gashes all through it, but the chalk should be held in such a manner that the line will run between the thumb and chalk, *wearing down one side of the chalk*. A little skill will enable a workman to wear a piece of chalk all out on the line without cutting gashes all through it. Select soft chalk, as hard chalk will not shed, and will wear out the line. For black chalk a billet of basswood, burned to a coal, and the fire quenched by dipping it in water quickly, will answer a good purpose.

THE HAMMER.

260. Fig. 103 represents a claw hammer; and the face should be of steel, so hard that it will not batter up, and not so hard that it will cleave off, and the claws should be of the same material. The handle should not be round, but of an *oval* form, so that it may be held in the proper position,

when in use, more advantageously than if the handle were round. The face should be ground smooth and true on a true grindstone, and should be parallel with a line cutting the center of the handle, as shown by the dotted line. If the face stands *inward* too much towards the handle, or in an opposite direction, or if the face be convex or one-sided, or if the corners be knocked off, it will be a poor thing to drive nails with. The face of a claw hammer should never be used for pounding on chisel handles when mortising, because the corners are so sharp that it will soon split them or wear them out; and it should never be used for hammering iron nor stone, lest the corners of the face be broken off or battered up. Make it a rule to use the claw hammer for nothing but driving nails and drawing nails. If oil or tar be on the face, it will be almost impossible to drive a nail with it until it has been removed. In drawing a nail out of hard wood with the claw, strike it one or two blows, enough to start it in a little, and it will come out much easier than if it had not been started in. When the hand grasps the handle, let the thumb lie lengthways of the handle, instead of clasping it, as shown in the figure. With the thumb on the top of the handle one can strike truer and longer without tiring his wrist. In order to drive a nail true, place the hammer on the nail, and then keep the eye on the nail, when striking, instead of the hammer. Never try to draw a nail with the claws if it will not start without starting the handle in the eye of the hammer. If one is always careful to put a little block or piece of iron under the hammer for a fulcrum, there will be little danger of starting the handle. If the hammer hangs correctly, and the handle gets bent, it will not hang right, and will bend a nail down before it has driven it in. If the face of a hammer is ground true, as it should be, on the grindstone, not one-sided nor convex, and if the face is in a line parallel with a line which would cut the center of the handle from end to end, as in the figure, and if the handle is made of a true and oval form, there will be little danger of bending nails over sideways when driving them. When the handle of hammer is *round*, a workman cannot perceive *by feeling* the handle whether a hammer is in the right position for driving a nail or not, but when the handle is of an *oval* form, and is put in the eye true, with the widest way of the handle in the direction *exactly from the claw to the face*, after a workman has become accustomed to a hammer he can snatch up his hammer without looking at it, and the perception of the fingers and thumb will determine most accurately the correct position for driving a nail. If the face of the nail hammer were a little *concave*, it would be less liable to slip or glance off when driving nails. A good nail hammer is not a proper tool to drive wooden pins with, nor for driving any piece of work together with, because the corners are so sharp that they will split a pin very readily, and make deep dents in the sides of anything that

Fig 103. Claw hammer.

is hammered with it. Should the face of a claw hammer become battered up, it should be tempered again, and made as hard as it will bear to be and not fly or break easily. The handle of a hammer should have a little bilge in it at the point where the hand grasps it, as in the figure. If the handle is made of a uniform size from end to end, a workman will be constantly losing his hold; whereas a little swell in a handle will prevent its slipping in the hand. (See turning hammer handles in the chapter on the farmer's workshop, and light and heavy hammers under momentum.)

THE SLEDGE HAMMER.

261. Sledge hammers are of various forms, and are made, when made properly, with a reference to the services which they are intended to perform. If a sledge is wanted simply to drive stakes and posts for fencing, the best form for such work will be a round cast-iron sledge with two faces, similar to the beetle. The faces of such a hammer should be convex a little, and not having sharp or square corners like the face of a claw hammer, because if the corners are square or sharp, if a workman does not strike exactly square when driving a stake or post, such sharp corners will make deep dents in them, and are far more liable to split a post than if the faces were a little convex; but it is not well to have the face too convex, because if they are too convex the efficiency of a blow in driving wood is partly lost in consequence of the great convexity of the face, which bruises and indents the wood more than if the faces were square. When the pattern for such a hammer is made, the convexity of the faces should not exceed one-eighth of an inch across the face, and the sharp corners should be rounded off a little. About twelve to sixteen pounds would be the proper weight for a hammer of this description. But such a hammer should never be used for pounding iron nor for breaking stone, because cast-iron hammers will break easily when hammering substances harder than wood.

262. The handle for such a hammer should be of an *oval* form, and of good timber, with a knob at the end of it, similar to the beetle handle, (see fig. 104,) with faces in lines parallel with a line cutting the centre of the handle, as shown at the beetle, fig 104; and the widest way of the handle should be in the direction from one face of the sledge to the other.

263. When a workman attempts to drive a post, for example, with such a hammer, which has a *round* handle, if he is not skillful in using such a tool, he will not be able to strike true; and will split half the posts which he undertakes to drive. When the handle is round, such a hammer may turn one-fourth of the way around in the hands; and, unless the workman can *see* the face of the hammer, he will not be able to tell whether he is going to strike with a *corner*, or *side*, or with the *face* of the hammer. But, if the handle be of an oval form, and the hilt oval, the perception of the hand will determine, very correctly, whether the face is in the proper position for striking a square blow, or not. Such handles are, almost always, made round; and we often see laborers strike, many times, a half dozen blows, without starting a post at all, simply because they do not strike true and straight; and they will strike with a *corner* of the sledge,

when it will fly over and over in their hands, and they will be obliged to give it up, with an exclamation "*it can't be driven,*" when the fault is partly in the *tool*, and partly in the wokman.

264. When a skillful laborer attempts to drive a post, with such a hammer, he will set the sledge on the end of the post, on the face, *square*, and at onne calculate how far to drop the hand that holds the hilt, in order to have the hammer strike square ; and he will grasp the hilt of the handle firmly, to prevent the sledge from striking on one corner ; and every blow, when the face strikes square, will crack as sharply as the report of a cut rifle. But, when an awkward, unskillful Jonathan attempts to drive a post with a hammer having a round handle, his blows sound as dull as if he struck a post of India rubber ; and he will hammer the end of a post all to slivers before it is half driven into the ground. Let the farmer bear in mind, that in order to have the blows of a hammer most effective, the face must strike *square* against the substance to be driven. When striking heavy blows, he should observe how he holds the handle when he strikes an effective blow, and then endeavor to keep the hammer as nearly in that position as possible, at every blow. A skillful laborer will, usually, strike truer, and more effective blows, by grasping the handle at the hilt with both hands, and swinging it at arms length over his head. But this manner of swinging a heavy sledge hammer is much more fatiguing and laborious, than to slide one hand towards the sledge, every time it is elevated.

265. STONE MAULS,

Are sometimes made of cast iron, for the purpose of breaking stone ; and, instead of a flat face, one end of the pattern is rounded off to a kind of *conical*, obtuse apex, while the other end is rounded in the form of a pyramidal apex, not brought to a sharp edge, but in the form of a blacksmith's swedge, for making a circular groove. A hammer of this form, will stand a vast deal of hammering, without breaking ; but it would be a worthless tool to drive posts or stakes with, because it would indent, and bruise and split the end of a post, without driving it but little. There are several other kinds of hammers, a notice of which does not seem to come within the province of this work. But as every farmer needs a hammer, besides the claw hammer, for riveting, a few words with reference to

266. THE RIVETING HAMMER,

May not be out of place, which for ordinary purposes, should weigh about one pound. If it be too heavy, rivets are very apt *to bend*, in consequence of too heavy a blow, when spreading the ends of them. The face of a riveting hammer should be a little convex, and the *edge* of it should be acute enough to dent, or spread the ends of a rivet, readily ; and it should not be so sharp as *to cut* the iron when riveting. Light blows, made with a light hammer, are more effective in spreading a rivet, than a blow of an equal momentum, made with a heavier hammer. (See momentum.) A riveting hammer should have a longer handle than an ordinary claw hammer, in order to give a greater velocity to it in striking. It is not very

practicable to spread the end of a small rivet with a hammer that weighs two or three pounds ; because, a stroke with such a hammer, would be so heavy as to crush, or double a rivet, before the end could be spread. Riveting hammers of almost any desirable size may be obtained at most of the hardware stores.

THE MALLET AND BEETLE.

267. A mallet should be made of some very hard wood, and, if it be not made of a knot, the ends of it should be banded, like the beetle, to keep it from splitting. That part of a tree, if it be tough wood, which grows just above the surface of the ground, what is called the crook, will make the very best mallets, which will require no hooping. I have a mallet which was made of the crook of a part of a white ash stump, which has been the only mallet in use, for framing all my buildings, and doing all my shop work, for sixteen years, and it is not half worn out, as yet. A mallet should be turned out true, with the ends convex, or rounding, not less than half an inch from edge to edge. The handle should be put in true, so that the faces will be parallel with the handle, as shown in the fig. 104. Let it be well oiled to prevent its cracking. Never allow the faces of the mallet to be bruised, and dented on iron bolts and such like, but keep it smooth for pounding on chisel handles only. A tough piece of apple wood will make about as good a mallet as almost any other kind of wood. But if it is made of a round piece of wood, on account of its great liability to check, it should be treated as recommended for

Fig. 104. A Wooden Beetle.

BEETLES.

268. Figure 104 represents a farmer's beetle made in a workmanlike manner. Beetles should always be turned true, and the handle turned of an oval form (see Sledge Hammer), and put in very true, so that a line cutting the center of the handle will be exactly parallel with lines continued square across the ends or faces of the beetle, as shown by the dotted lines figure 104. The beetle should hang as nearly like the sledge hammer as possible, and the reader can refer to that paragraph for the information which seems to be lacking in this place.

269. Beetles should be made of very firm tough wood, such as the butt end of a small locust, iron wood or apple wood. If a beetle is to be made of a round stick, which has the heart of the tree in the center, when the timber is green a lot of beetles should be sawed off, about eight or nine inches long, in late autumn, and an inch and a half hole bored, *lengthwise*, through the center of the sticks, and they should be allowed to season during the winter, not in a stove room, lest they check badly, but under shelter. The object of the hole in the center is to allow the timber to

settle together without cracking or checking. When they are made of split pieces of wood it will not be necessary to bore them, as they will not check like a stick with the heart in it. (See Seasoning Timber.) When they are seasoned *thoroughly* turn out a tough stick, just large enough to drive through the beetle, and turn out the beetle like the figure, with a shoulder two inches from each end, leaving the ends just large enough to receive the rings when they are red hot. (See Expansive Force.) By heating the rings before putting them on, and driving them down to the shoulder while hot, and then by cooling them quickly, before they have time to burn the beetle but little, they will, by contracting, become so tight that they will remain tight until the beetle is worn out, without wedging. Should they become loose, let them be wedged well with wedges of hard, tough timber. Many men will wedge such things with wedges of soft timber, but every good mechanic, who knows anything about driving wedges, will tell you that anything can be wedged very much tighter with hard wood wedges than with wedges of soft wood. Use an inch framing chisel for making checks in the ends of a beetle for the wedges, and make the wedges a sixteenth of an inch wider than the chisel, and then they will not work out. Some men prefer to have a beetle made *without* any shoulder for the rings, but my experience teaches me that a beetle will wear longer, and the rings remain true longer, when it is made with shoulders than when it is made of a true taper, without shoulders for the rings, because if a laborer happens to strike mostly on one side of the end of a beetle, unless the rings are so tight that they cannot be moved by much pounding, one side of the rings will be driven on farther than the other, and the faces will soon become one-sided, and then it will be an awkward tool to strike with. And if the rings are not very tight, when the wood begins to batter and spread over them they will drive on towards the middle of the beetle, and a beetle will be all stove up and worthless before it is half worn out.

270. The size of the different parts of an ordinary beetle is about as follows: beetle eight or nine inches long, shoulders two inches, rings, of the best of iron, one inch wide, about three-eighths of an inch thick, and about large enough to go on the end of a beetle, five inches in diameter, and handle about thirty inches long. For a strong man the handle should be longer than for boys, or men of inferior strength. Where the handle enters the head it should not be less than an inch and a half in diameter. The hilt and straight part of the handle may be made to suit the size of the laborer's hands. A man with small hands and short fingers needs a smaller handle than he who has very large hands, with fingers of a corresponding length. Great care should be exercised in putting in the handle, lest it stand as shown by the dotted handle in the figure. It is no uncommon thing to see handles standing at such an angle, and when they do we hear those who use such beetles complain of having their hands hurt often by the jar, in consequence of not hitting the wedges true, and, more than all else, beetles that are hung one-sided wear one-sided, and as they usually

in striking hit *one corner* or *one side* of the top of an iron wedge, they will not wear as long, nor will the force of driving, when the beetle is in use, be half as effective as if the face struck the wedge perfectly square. (See Using Sledge.) After the rings have been put on, and the handle driven in, make two plugs of hard wood, and drive them in the ends of the beetle very tightly, and saw them off even with the surface, and it is ready for use.

HANDLING A BEETLE.

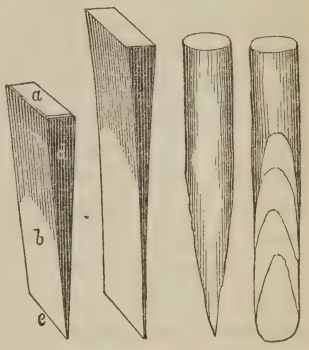
271. It is often very amusing to see how awkwardly and inefficiently many laborers handle a beetle, in splitting wood or rails, or anything else. One blow will be on one corner of an iron wedge, and the next blow will be on another corner, and the next one will be in such a manner that one corner of the wedge and beetle ring will come in contact, and the beetle will roll over and over, and very likely, will fly half a rod, and when the laborer goes to get his beetle again he will be very likely to find a ring broken. When beetle-rings are put on as tightly as they ought to be, one or two awkward blows with the beetle, in such an unskillful manner, that the iron wedge and beetle ring will come in contact, will snap a ring asunder, instantaneously, unless it is of the very best iron, and even then rings will often break, especially in frosty weather, when the blow is not very powerful. Laborers ought to know—but I blush to say that one in fifty does not know—that, when the face of a beetle is struck on the *corner* of an iron wedge, the blow is not half as effective as it would be if the face struck the head of the wedge *entirely square*. And more than all this, when all the blows are applied to a *corner* of the wedge, a beetle will be completely worn out before it has performed one-fourth of the service that it would have done had the blows been in such a manner that the face of the beetle and head of the wedge came together *square*, as they should come. It is most surprising to witness how long a good beetle will last some laborers, and how much they will use it at hard pounding, while on the contrary, it is still more surprising to see how very soon another laborer will use up a good beetle, before he has used it enough to begin to even think of its being worn out. The first alluded to always strike very true and square, while the latter deal their blows in every imaginable way but square and true. A laborer who handles his beetle with skill, will pound very hard on his wedges, all day, and the faces of the beetle will be battered but little, while he who strikes awkwardly with a beetle, just as good as the other, will use it up in one day, as if it had been in hard service for a week or more. It is all folly to use up beetles at such a rate, and a laborer ought to know better than to strike a ring on an iron wedge or to strike a *corner* of a wedge with the face of the beetle.

272. In whatever position a wedge may be standing place the face of the beetle and head of the wedge *square together*, then grasp the hilt of the handle, firmly, and be careful to make every blow *square*, and not on one side of the face of the beetle, but as nearly in the center of it as may be. If a wedge leans a little or varies its position, as it is driven in, let the

position of the beetle be varied accordingly, so as to have the beetle and wedge strike each other *exactly square*. By exercising a little skill in this respect a laborer will very soon find that he will be able to drive a wedge with half the number of blows, and not use up his beetle one-fourth as much as when he deals his blows *every* way, but square on the head of the wedge, and face of the beetle. (Read the paragraph on the hammer and sledge.) As beetle and wedges are used together I shall now notice

273. THE WEDGE.

Figure 105 represents a well formed iron wedge, and *a* is the head, *b* is one of the sides, and *d* is one of the edges, and *e* is the entering edge. A wedge will not rebound as readily when the corners, at the entering edge, are made flush, or square, like the figure, as it will when the corners are rounded off very much, like the edge of an old ax, the corners of which are well ground off. Sharp corners of an iron wedge make it *stick* when entering.



105, 106, 107, 108.
Wedges.

274. Figure 106 is a very ill shapen wedge but very like the iron wedges which many laborers use, and exactly like the wooden wedges which are often made with the false impression that they will be more effective of such a form than if they were like figure 105. But wooden wedges of such a form cannot possibly be as effective, for any purpose, as if they were like figure 105; because, small wedges of such an ill form will be *crushed* at the entering point before they are half driven in, and if large wedges are made of such a form, it requires a greater number of blows to drive one in far enough to open a log two inches.

275. Every author whose writings I have consulted on the subject of the wedge, has simply spoke of it in philosophical or *theoretical* terms, and the most important considerations which affect, directly or remotely, many of the operations of the farm, and which are all-important for the beginner to understand, have been entirely overlooked or rejected, and what has been penned in reference to the wedge, if put into practice, according to the strict letter of the various writers, will, in practice, lead the beginner into most egregious errors. The wedge has always been considered as a *double inclined plane*, and its efficiency has been spoken of as being in proportion to the acuteness and length of its sides. *Theoretically* speaking, this is all correct, but in *practice*, no principle in philosophy proves to be more erroneous than this. *Theory* would tell the farmer to make his wedges, in order to be most effective, when impelled by a given force, sixteen or twenty, or more feet in length. But practice instructs us that there is a certain length for a wedge, and thickness for the head, which is much more effective, when impelled by a given force, than if it were longer or shorter. Every man who has split much timber, knows too well that a wedge of the proper length and thickness can be driven into a log with less force than

one of the same thickness which is twice as long, to say nothing of a short and blunt wedge. Now this is what the beginner wants to know; he needs something *tangible*, some instruction in making wedges that will render his labor as light and effective as possible. Suppose, for instance, an iron wedge is two inches square at the head, and its sides of a true taper to the edge, and twelve or more feet long. Theory would instruct us that a wedge of such dimensions could be driven with less force than one about ten inches long, of a true taper to the edge, with the head of the size already mentioned. But, in *practice*, we find that such a long wedge would be utterly useless, because it would not possess sufficient strength to resist the force of heavy blows, without being *crushed* or doubled up in places, and it would be very liable to twist and turn wherever the grain of the timber run, and more than all else besides, it would require three times as many blows to drive it up to the head, that it would require to drive a wedge of the proper dimensions, and the friction would be so incalculably great, in such a long wedge, that it is not at all probable that the force exerted by one man with a beetle would be sufficient to drive such a wedge clear to the head, even were it sufficiently strong to bear driving. And even if such long wedges were most effective, they would be most inconvenient and unwieldly tools. As the friction in driving wedges is usually so intense, the idea of an intelligent laborer always is, to have the most *economical* and *convenient* amount of surface in the sides of the wedge, which will prove most effective under a given number of blows. This leads us to speak of

THE MOST CONVENIENT AND EFFECTIVE DIMENSIONS OF WEDGES.

276. Iron wedges for splitting timber should always be so thick and strong that they will not bend nor twist even when driven into the toughest knots and gnarls. The size which has been found in practice to be the most *convenient and effective* for ordinary purposes, is about ten inches long, two and a half inches wide, and about two inches in thickness at the head, and of a true taper to the entering edge, which should not be brought entirely to a feather edge, but the entering edge should be left about a sixteenth of an inch thick when it is tempered, and then ground off to a sharp edge like the edge of an ax. The entering edge of iron wedges should be made of steel, and tempered about as hard as for cold chisels. Iron wedges may be smaller than this, or larger, if desired; but it is just as well when a man has two wedges of the size just mentioned, to have gluts, as large iron wedges are rather costly and are no better for following in a check made by iron wedges than a good glut.

277. One very important consideration which has been and is entirely overlooked by laborers, is to have their iron wedges *in the most proper order*. The head should be a little convex, and the sharp corners smoothed off a little so that they will not cut the face of the beetle. The two edges and two sides should be hammered as true as is convenient, and then they should be ground off on the grindstone as smoothly and true as the blade

of a saw. After the sides are ground smooth, if they were polished they would enter their whole length with less than half the number of blows which would be required to drive the same wedge unpolished and all battered up, as wedges usually are. Laborers are not aware how much unnecessary hard pounding they perform when the entering edge is very dull, and the sides uneven and rough, and they will not believe that there is really but little difference after all in driving rough and smooth wedges, until they have some ocular proof of the fact. But let the beginner or any one else rest assured that it will abundantly remunerate him in saving hard labor to polish the sides of iron wedges, and to keep them smooth and the entering edge sharp.

278. Is it suggested that if well polished and sharp they will not *stick* as well as if left rough and uneven? I know, and any one can try the experiment, that a polished and sharp wedge will not recoil, when splitting green or frozen timber, half as often as a dull and rough wedge, and with sharp and well polished wedges a laborer would be able to split frozen timber when it would be impracticable to do anything with it if the wedges were dull and rough. Iron wedges should never be driven with an instrument of iron, because it would soon batter and spread the heads and destroy their proper shape. When wedges are driven with an iron beetle, they soon become in shape like fig. 106, with the head spread so that the sides are not of a true taper. When it is almost impossible to make a wedge stick in green or frozen timber, by having the wedge quite warm, or by driving a little wedge made of dry wood into the check, and then drive the iron wedge into the dry wedge, it will usually stick. Some laborers will drive a little flat stone into the check where the wedge was started, and then drive the wedge into the stone in order to make it stick; but stone will usually make the sides of a wedge rough, so that it will drive hard.

GLUTS.

279. Gluts are large wooden wedges, and are not to be driven into the solid timber like an iron wedge, but into the checks which have been formed by the iron wedges. They are usually made of round sticks of timber, with two sides flatted at about the same angle of iron wedges. A lot of sticks ought to be sawed of the proper length, and laid up under shelter in a safe place where they will be seasoned and ready for use when gluts are needed. None but the hardest and toughest timber should be used for gluts, and if made when the timber is green, they will check less, and it is not half the work to make them that it would be to make them after they are seasoned. Laborers generally make no provision for gluts until they arrive at the woods or where they are to labor, and then they will make gluts of the limbs of a green tree, which are very poor things for such a purpose, and spend time enough to no good purpose to pay for half a dozen well made gluts. And, more than this, gluts made of green timber will seldom last one quarter as long as if seasoned, and they require many times twice as many blows to drive them as if they were seasoned. And another thing of importance,

it is not at all practicable to make a glut in a workmanlike manner with the ax only. I know that they are usually made with no other tool but the ax, and they are made of every imaginable shape and form, like fig. 106, or like 107, which shows an edge view of a glut which has been made with the ax alone. It will be discovered that the face sides, which should be true and smooth as the face of a plane, are very rough and hacked up, and not of a true taper, and will require more than twice as many blows to drive it as if it were true and smooth. He who wishes to appropriate all his strength, or the strength of his laborers, to the most effective purpose when splitting timber, will make his gluts at the work shop and have them well seasoned before they are used.

280. The most proper manner of making a glut, is to dress it off with an ax, as true and smoothly as practicable, leaving the entering edge never *less* than half an inch thick. In large gluts the entering edge should be three-fourths of an inch in thickness. Then, put it in the vise, and plane it off true and smooth, and round the corners of the head, and the corners of the entering edge with the drawing knife, as shown at fig. 108, which represents a view of the face side of a well made glut. If the entering edge of a glut is reduced in making it to a feather edge, it will be very liable to be split and shivered to splinters, when it happens to be driven on to, or among slivers. It may seem too unnecessary to finish the face sides of a glut with a plane; but let two wedges be finished, one with a plane, as directed, and the other with an ax only, and a laborer of keen perception will quickly tell which will drive the easiest. If a glut is not smooth and true on the face sides, it will be far more liable to recoil, or "bound out," when opening a log. Wedges of every description should be smooth and true.

NOTE.—The preceding article on fencing, and tools used in fencing, is a part of a work entitled "The Young Farmer's Manual," which has been prepared with much care to aid the young farmer in performing the labors of the farm economically and expeditiously. All the suggestions on fencing have been tested practically—and most of the styles of fences given have been built under the directions of the writer, and it has been his endeavor to give directions so plain and intelligible, that the young farmer, who is possessed of ordinary ability, can readily perform work which he otherwise could not do without a foreman. It is written not for the mature farmer, but for those who are entering on the farmer's pursuit from various professions. The minute details given, will therefore be pardoned by those who are familiar with farm work. S. E. T.

CORRESPONDENCE.

U. S. AGRICULTURAL SOCIETY'S FAIR, RICHMOND, VA.

No. of Entries in each Department and Amount of Premiums Awarded.

	Entries from Virginia.	Total No. of entries.	Amount premiums offered.	Amount premiums awarded.
Cattle department,	54	110	$2,810	$2,125
Horse and [1] mule department,	158	191	2,510	1,730
Sheep (pens) departments,	38	51	1,250	820
Swine department,	14	24	280	170
Poultry department,	21	39	185	82½
Farm and garden products department,	51	68	505	210
Domestic productions and Manufacturers' department,	27	290	495	357
Mechanical department,	57	188*		
Fine arts and general utility,	61	74		

One Gold, 56 Silver, and 40 Bronze Medals; and 100 Diplomas.

Report of B. P. Johnson, Secretary.

We attended this fair, with Hon. Henry Wager, Ex-President; Hon. W. T. McCoun, President; C. S. Wainwright, Vice-President; and W. S. McCoun and Hon. Benj. N. Huntington, as delegates from our Society. Several exhibitors were also present from our State, all of whom, we believe, received first premiums. The fair was held in connection with the Virginia Central Agricultural Association, who guarantied a certain amount to the United States Society, sufficient to pay premiums and expenses, and who furnished the grounds and had charge of all the arrangements connected therewith, up to the day of opening. All the preparatory arrangements were carried out promptly, and everything was in order on the 25th. The grounds for the fair were those heretofore used by the Virginia State Agricultural Society, whose fair the present year was held the week succeeding the United States Fair. That Society took no part in the Exhibition at Richmond—few of its officers even, so far as we

* Of the 188 entries *for premiums*, in the Mechanical Department, Virginia contributed 57, New York 23, Pennsylvania 17, Maryland 8, Ohio 5, Delaware 5, Massachusetts 3, North Carolina 3, Illinois 2, Michigan 2, District of Columbia 2, Rhode Island 2, Maine 1, Vermont 1, New Jersey 1, Tennessee 1, and Alabama 1.

could learn, were present at any time during the fair. What occasioned this we are not advised.

The grounds contained eleven acres, for the exhibition of all stock and articles on exhibition, except the horses, and were arranged admirably for the purpose. A row of stalls for cattle, sheep and swine, passed entirely around the grounds, except entrance gates, offices, &c. These were very comfortable, and had a walk in front of them, under cover, for visitors—and on the day when the rain was very severe, during the fair, they were entirely protected from the storm. Above the stalls the hay and fodder were stored ready for the occupant of each stall, to use as he needed. The inside of the grounds had a wide pathway, gravelled, into which, from the corners of the grounds, entered various alleys for footmen, and the ground was divided up into plats, covered with a fine turf; on these were trees, shrubbery and flowers—and the various articles exhibited and not under cover were here displayed. Large tents—for the speaker, for flowers, fruits, domestic goods, fine hardware, small implements, &c., were conveniently arranged; and tents for officers, judges, press and guests, were placed in different portions of the grounds; and flags of the United States, England, France and Spain, were floating from the different tents and halls—the whole presenting a picture of unequalled beauty, when filled with the exhibition articles and with visitors. We think it the most perfectly arranged show grounds we have seen. Adjoining were five acres for horses—stalls on three sides, and an amphitheater for spectators, and refreshment saloon on the remaining side. The seats would hold several thousand people, and were fully occupied during the pleasant days.

The entries made on Monday and Tuesday were quite as large as could have been expected. The show of cattle was an excellent one. The leading breeds of cattle were all represented more or less extensively—and some of the stock in the Short Horn and Devon classes would challenge competition. Five Herefords from Ohio were of first quality, and two from Maryland were good. The fat cattle shown were very superior, and there is rarely seen such a selection of well fattened animals. These were fattened in Virginia, or most of them, and speak well of their mountain pastures, which I am told are equal to the best Kentucky blue grass pastures.

The show of long-wooled sheep was very superior. The flock of Col. Ware, of Virginia, cannot be excelled anywhere. He breeds from none but the first prize animals from England, and his sheep are equal, if not superior, in many instances, to the imported ones. A splendid show of Silesian merinoes attracted, as they deserved, great attention. South Downs, French and Spanish merinoes, were shown of good quality. The sheep department was a success.

The swine were generally good—the Chester county being the favorite of the large breed, and the Suffolks of the small breed.

The poultry was very fair—many very fine birds, and of most of the approved varieties. The monstrocities were not there. Taking the stock

together, I was told by a gentleman of Virginia, that it was probably superior to any shown there at State Exhibitions.

The show of horses was exceedingly fine, especially in the thorough bred classes. "Red Eye," "Revenue," "Fly by Night," "Rescue," &c., and their progeny, comprised a better show of blood horses than I have ever seen.

Implements and machinery were also very fair, and several of our northern firms had some of their choice implements, and secured the awards against all competition.

In the domestic, miscellaneous, fruit, floral, and grain and vegetable departments, the exhibition not large, but respectable as to quality.

On Tuesday at 12 o'clock the exhibition was formerly opened, by the president, and his address and the proceedings, taken from the Richmond Enquirer, are annexed.

[From the Richmond Enquirer.]

THE SIXTH NATIONAL AGRICULTURAL EXHIBITION.

The inaugural ceremony of the sixth exhibition of the United States and Virginia Central Agricultural Societies took place formally yesterday, on the Richmond Fair Grounds, amid a large concourse of citizens. At noon, as many of the immense concourse as could conveniently listen, gathered in the large central marquee, to hear the opening address of the president of the society. The following gentlemen had been appointed a committee to wait on Ex-President Tyler, and escort him to the tent: Col. Allston, of South Carolina, Capt. Horncastle, of Maryland, and J. Pegram, Esq., of Virginia.

A similar committee was appointed to wait on the Governor of Virginia, viz: Capt. Conti, of Maryland, H. Clay Burgwin, Esq., of North Carolina, and C. S. Wainwright, Esq., of New York.

Among the distinguished gentlemen on the platform, near Gen. Tench Tilghman, were ex-President Tyler, Gov. Wise, Hon. Caleb Cushing, Judge Daniel, of United States Supreme Court, James Lyons, Hon. Wm. C. Rives, and others.

The proceedings commenced with an appropriate prayer by Rev. Dr. Hoge, after which James Lyons, Esq., as President of the Virginia Central Agricultural Society, introduced Gen. Tench Tilghman to the assemblage, whom he addressed as follows:

INAUGURAL ADDRESS OF GEN. TENCH TILGHMAN.

Brother Farmers of America, Ladies and Gentlemen, of whatever clime and occupation,—You have listened to the language of eloquence and cordial hospitality with which we have been welcomed to the capital of this ancient commonwealth, by the distinguished President of the Virginia Central Agricultural Society.

It becomes my pleasing duty to acknowledge the obligation which has thus been conferred upon us, and as the official organ of the Agricultural Society

of the United States, to extend to all who are here assembled a greeting to this, its sixth annual festival.

Gentlemen of the two societies, allow me to congratulate you, and those who are our especial guests on this interesting occasion, upon the success with which your efforts have been crowned, in the magnificent spectacle by which we are now surrounded.

From the granite hills of New Hampshire to the verdant rice fields of Carolina; from the swarming cities on our Atlantic border to the fertile valley of the Mississippi, Ceres and Pomona have vied with each other in contributions from the richness of their stores; and in the varied products of the farm and the garden, the mine and the ocean depths, the workshop and the laboratory, which are here gathered together, we behold an epitome of our country's greatness, and an evidence of its enduring prosperity.

A still more pregnant indication of the importance attached to the calling in which we are engaged is to be found in the magnitude and character of the vast concourse which has assembled to witness our exhibition, and in the number and distinction of the representatives from other States who have come to participate in our proceedings. The sturdy yeoman has left his fields and his herds, the mechanic has deserted his workshop, the learned professions have contributed from their members those who have earned the highest distinction in the varied walks of science and of literature, the highest dignitaries both in church and State are here, to honor us with their presence, and beauty has sent a chaplet of her choicest flowers, whose richness forms the crowning glory of the scenes, and holds the admiring spectator entranced and spell-bound in mute admiration of its loveliness.

Among the many remarkable developments by which the growth of our country has been attended, few have afforded greater cause for surprise and gratification than the rise and progress of the United States Agricultural Society.

Its great prototype, the Royal Agricultural Society of England, has been in successful operation for many years, sustained by all the wealth and enterprise of that powerful and enlightened nation, before it ventured upon the experiment of migration in its fairs, which has since been found to be so highly beneficial in its results. Even there it is still regarded as an undertaking of no ordinary magnitude, and yet the actual extent of their migrations is less than those of the State Agricultural Society of New York, whilst the smallest distance between the locations of any two consecutive fairs of the United States Agricultural Society has been greater than the entire extent of the United Kingdom of Great Britain.

It is an interesting incident in the history of these two greatest agricultural nations of the world, that the present mode of conducting their national fairs was commenced almost at the same period, and has been attended with results which evince a remarable degree of coincidence.

Their exhibition for the present season was held in the ancient city of Chester, and many of the most distinguished of the nobility and gentry

attended their meetings, and participated in their proceedings. Among those whose eloquence contributed most largely to the interest of this memorable occasion was the Right Hon. W. E. Gladstone, M. P., now one of England's greatest commoners and purest statesmen, and I was forcibly struck with his impressions of the effect of such gatherings in England and their applicability to our own society.

"I think it may be truly observed (said Mr. Gladstone) that this—I must say distinguished—I may say illustrious society—appears to me to supply a want which is the greatest inherent want of agriculture. If we look to the case of manufactures, it is their nature to collect themselves in enormous masses around great centers of industry. If we look to commerce, incessant communication between every part of the commercial system of the country is the very vital air it breathes, and it is naturally inseparable from commercial development. But with agriculture the case is different, for, on the contrary, its nature is to be gathered around local centers, which, under ordinary circumstances, have little or no connection or communication with one another. It is, in comparison, an isolated art, and, therefore, it might follow, under general circumstances, that agriculture was languishing in various quarters of the country, simply from a want of a knowledge of the progress achieved in other portions of the land. Well, now, if I am right in saying that this is the besetting danger and difficulty of agriculture, is it not true and obvious that the society whose festival we commemorate to-day, is, by the very principle of its construction, adopted effectually to supply that want, for its business is to bring together the men and the minds of all portions of the country? The stock of Devonshire, the horses of Suffolk, the various products of England, are exhibited in the yards to-day. The agriculture of England, through the means, mainly, of this society, is rapidly attaining to the position to have but one heart and one mind—one common pulse that causes the circulation of the vital fluid throughout the whole system—one common stock into which every thing that skill, that industry, that intelligence, that capital had achieved in every single part of the country, is made the common property of every other portion of the country."

These, gentlemen, are some of the considerations on which we invite your assistance and co-operation. The great principle which has achieved such wonderful results in our own country is that of *associated enterprise*, and yet how little has been done by the farmer to avail himself of its benefits. How few of those who see the fruits of their honest labors wrenched from their grasp by the iron clutch of the remorseless speculator, or rendered valueless by the over-production of some of their most important staples, ever reflect that there are now in existence in the United States nearly eight hundred agricultural societies, and that by the contribution of a single dollar from each one of their members, a fund might be raised sufficient to secure on a permanent foundation the organization which the United States Society have already successfully established. One of the

most important features of this organization is the *Monthly Bulletin*, which has been issued since the month of February last from the office of the society in the city of Washington, and which, together with the annual volume of its Transactions, is furnished gratuitously to those who become life members by the trifling contribution of ten dollars to its treasury.

Unpretending in its appearance, and avoiding all intrusion upon the legitimate sphere of the various agricultural journals which are laboring so successfully in different parts of our country, the *Monthly Bulletin* presents a claim upon the confidence of the farmer, to which no one of these journals possesses in the same degree. It has no other possible interest to subserve than than of the farmer, whose journal it is, not even that of its editor, who is the permanent secretary of the society. It relies solely upon the gratuitous contributions of the farmer for its support, and were those contributions ever so generous, they would be devoted entirely to the benefit of the whole farming interest of the country.

How easy then would it be for the farmers of the nation to establish an almost telegraphic intercourse between every section of our extensive country, by a simple system of monthly reports from all the agricultural societies and prominent farmers to the Secretary of the United States Society at Washington. The information thus obtained from each, would be combined and transmitted to all. The opportunity for speculation would be greatly diminished. Humbugs, that are often so rife throughout the country, and of which the farmer appears to be the favored victim, would be fearlessly exposed, and in a short time a fund of satistics would be obtained from the collation of which important results might be adduced.

The benefits derived from such a commencement would increase the desire for their extension, until, at no distant day, the society might hope to obtain, by endowments and other contributions, the means of establishing a quarterly journal of agriculture, in whose columns those most deeply versed in the arcana of nature might discuss the abstruse principles upon which the most important results are often found to depend, and yet which do not possess a sufficient attraction for the superficial reader to obtain for such a journal a support sufficient to secure its existence by subscription alone.

It is not a little surprising, that the portion of our country in which the agricultural interest is most important, should have been the last to lend its co-operation towards the advancement of this society.

We are now assembled, for the first time, upon southern soil, and I hail it as a good omen that the Old Dominion, the mother of States, and whose fair daughters have been the nursing mothers of Presidents, should have been the first to welcome the United States Agricultural Society to her territory and her capital. The atmosphere by which we are now surrounded is redolent with the memories of those illustrious statesmen and great farmers, who constituted the Cincinnati of our youthful republic; and it is impossible to look upon yonder noble river, whose banks are now

teeming with the fruits of commerce and agriculture, without remembering that here lived the graceful Pocahontas, and here too were the cornfields of Powhatan and Opechancanough, which preserved the lives of our famishing progenitors in the infant colony of Jamestown.

The route by which many of us reached this hospitable city, conducts the traveller to that shrine which has become the Mecca of the patriots of all lands. As I passed, in the solemn stillness of the night, the spot where rest the ashes of the Father of his Country, I felt an influence pervading the scene, as if his spirit was still lingering in the quiet shades of Mount Vernon; and as if the vocations which absorbed so much of his thoughts and attention whilst on earth, were still regarded as not unworthy of his remembrance. "Go, tell your brethren," (he seemed to say,) "that they are engaged in a noble and a holy cause; tell them to persevere in an effort which only requires perseverance to achieve success, and which, if successful, must have a powerful influence in cementing those institutions to whose foundation my life was so largely devoted."

Gentlemen, this is the spirit which should actuate every American farmer and every patriot in the land, whatever be his calling or profession. Let me urge you, then, to come up to the good work without delay. Let it be one of the proudest boasts of every American citizen that he is also a member of the National Agricultural Society.

Gentlemen, it only remains for me to announce to you that the Sixth National Exhibition of Agriculture has been now formally opened.

After the delivery of this address, (which was received with great applause,) loud calls were made for Governor Wise, who responded briefly, owing to his indisposition. Next, Ex-President Tyler and Hon. W. C. Rives were called forth, and likewise made a few brief and pertinent remarks on the occasion, which were loudly applauded; after which the people dispersed to witness the exhibition of horses in the ring, and other attractions.

On Wednesday the judges commenced their examination—the attendance very large and thronged even during the day; and when the thorough-bred horses were brought out for examination by the judges, the stands for spectators were crowded, mostly with ladies of beauty and fashion, from city and country. The number of persons in attendance were estimated at 10,000 or over. At twelve o'clock Mr. McFarland, of Richmond, delivered an address, welcoming the guests of the Society to the hospitalities of the citizens. He was replied to by Mr. Cushing. Much work was done by the committees, and, although great delay arose from the absence of the judges, the vacancies were filled as soon as practicable. A meeting for discussion was held in the city in the evening, and Mr. Rarey, the horse tamer, and brother of the one in Europe, gave an account of the method of operation, which was very interesting.

On Thursday there was a large attendance, and most of the stock and implement committees completed their examination. At twelve o'clock Hon. Caleb Cushing delivered the Annual Address, which occupied nearly

two hours, and was an able effort, though not specially agricultural in its character. After the address, a committee, consisting of Col. Taylor, of Virginia, Mr. Cushing, Mr. Johnson, of New York, Maj. French, of the army, appointed to witness the performance of Mr. Rarey, in reclaiming a vicious, kicking mare, met in the large tent, the officers of the Society, Lord Napier, Gov. Wise, and other guests of the Society, with several ladies, and the pupils of Mr. Rarey, who had subscribed ten dollars each to learn the art. The vicious qualities of the mare were very clearly demonstrated, both out of and in the tent, and Mr. Rarey, in about one hour and a half, very materially reformed her, by the most kind and gentle means ; and I understood, after the committee left, that the owner rode her about the horse ring, being satisfied that the work was probably done. There is much in this matter, and we are so well satisfied with it that we would most readily give him his price to become acquainted with his secret, if we had but a single horse of our own. Mr. Offat, another tamer, and with an entirely different method, operated upon two unbroken colts on the grounds, and accomplished his work in a very little time. This I give from report, as I was engaged at the time, and did not see it. Thursday evening there was an agricultural meeting, and the subject of agricultural implements, especially plows, elicited much talk, and the President, who presided, informed me it was a meeting of interest.

On Friday the rain poured down in torrents, and the attendance was very small. The examination of the fat cattle took place under the tent, and of itself, this display was worth a journey here. Some of the animals were very large, and evidently had cost more to fat them than they were worth. They were mostly from Virginia, and showed that the pastures near the Blue Ridge are as good as any in Kentucky. The bullock to which the first prize was awarded, though not so excessively fat as the others, was a very nearly perfect pattern of a profitable fat ox, He was a grade Short Horn, of fine bone, splendid handler—his meat laid on remarkably even, and more good meat than I ever saw in a bullock of his size. The cows and heifers were extraordinary—mostly Short Horns and their grades. Virginia may well be proud of these cattle. As this day was to try the speed of horses—notwithstanding the storm they were brought out, and some good time made. Most of the committees had closed up their work, and to-morrow there will be little to be done except the speed of matched horses and exhibition of herds for premiums, if the weather will permit. At one o'clock, Hon. Wm. C. Rives, of Virginia, delivered the closing address, which was worthy of his fame and was admirable in its character, as follows :

Fellow Citizens, Ladies and Gentlemen—The occasion which has brought us together, and of which the various services are now to be closed, has been attended with many satisfactions, and has not, we trust, been without useful and profitable instruction to us all. To us of the " Old Dominion," it has been attended with both honor and pleasure. It has given us the proud and valued privilege of receiving on the soil of Virginia, and wel-

coming to our hearth-stones and our hearts, our brother farmers and friends of the other States of the Union.

There has been no such family gathering within our limits since the memorable occasion, just seventy-seven years ago, in this glorious month of October, when our brethren from the North and the South, (the great West was then the infant Hercules in his cradle,) came trooping in, with the splendid chivalry of our gallant European ally, to assist us to deliver our soil from invasion; to devote it thenceforward to the peaceful labors of the husbandman, and from the redoubts of Yorktown to wave the banner of liberty and independence over the whole continent. On a more recent occasion, it is true, our sister States deputed a few of their distinguished citizens to join us in the monumental honors decreed by his native State to the great farmer chieftain, who led our fathers in that eventful scene; but now we hail as our guests the sovereign people in the persons of those who, like ourselves, are engaged in the quiet and industrious pursuits of private life, and who bring their household deities along with them.

Nowhere, we flatter ourselves, could such a meeting have taken place with more of fitness and propriety than in this ancient Commonwealth, now the central State, on the Atlantic seaboard, of our extended Union: the theater of the closing scene of the Revolution which established our National Independence; the parent of the Federal Constitution which made us one people, and ever cherishing with fidelity and affection, while they have been respected by others, those fraternal relations which belong to the members of one great family of confederated States.

Here, in the midst of these hallowed and endearing recollections, we have joyfully welcomed to this arena of friendly competition and kindred communion, our fellow citizens from the North and the South from the East and the West; and even when any one of them has borne off the prize of excellence and superior skill from our own neighbors or ourselves, we have seen it without envy or repining, for it was a brother who won the well-merited meed. We all remember in our early reading how Hector was incensed at the success of Paris in carrying off the prize of the magnificent and coveted bull of Ida, so long as he supposed his fortunate rival to be a stranger; but the moment it was revealed to him that the successful competitor was his brother, his feelings of jealousy and rage were turned, not merely into acquiescence, but into a generous sentiment of fraternal pride and satisfaction.

In that enlarged and comprehensive view of American agriculture, however, which forms the province of our National Society, now holding its annual festival here in the bosom of Virginia, in harmonious conjunction with one of the Societies of the State, the agricultural interests of the different States are rarely presented in any relation of rivalry. Nature has so bountifully endowed the grand and teeming continent on which we live, with diversified aptitudes and capacities of production, that the rural economy of the United States embraces almost every variety of culture known to the industry of man; and to each is assigned, for the most part,

a distinct and appropriate locality, so separated and defined as not only to avoid the danger of injurious competitions, but to make the productions of one minister to the natural wants and deficiencies of another.

'Tis thus that, in the beneficent arrangement of our great national heritage as an agricultural people,

"All nature's difference keeps all nature's peace."

To one region has been given the staples of cotton and rice, to another the sugar cane, to another a plant whose conventional use has made it an article of great and increasing commercial value—tobacco; one is endowed with peculiar advantages for the production of wheat, another for the grasses and live stock, another for wool, another for hemp, another for mining, another for timber. To all is common the great American cereal Indian corn, but as its abundant production is almost wholly absorbed in its lavish domestic consumption, it gives rise to no serious or disturbing competition among the producers.

Never was the national agriculture of any country so all-sufficient in itself to supply every want of its inhabitants, whether for food, clothing or lodging—yielding in overflowing abundance the raw materials for manufactures, and multiplied the most valuable objects for profitable exchange at home and abroad—adapted by the diversity of productions to render the different sections mutually tributary to each other's wants—thus encouraging that division of labor which, under certain limitations, is as essential to perfection in agriculture as in the other arts—and able to build up, by natural and spontaneous influences properly cultivated and wisely directed, the vastest, the most complete and harmonious system of internal commerce which the world has ever seen.

In this great scheme of American agriculture, no one branch pretends to any special favor or peculiar prerogative above the rest. All stand upon the same broad platform of mutual liberty, and the security of skill and labor in the enjoyment of their honest rewards. Each seeks its development, under the kind auspices of nature, in the soil and climate fitted for it, seconded by the creative powers of human industry and science co-operating with the free air, the bounteous rain, and pervading the light of heaven.

We sometimes hear it said that cotton is king, but the agriculture of America, as its political constitution, is republican. It owns no dynasty of privilege or power. If any one of those noble plants which constitute the chosen vegetable races of the new world, could fairly aspire to royalty, it would be that prince of cereals, Indian corn, a proud native of the soil, lifting high its imperial form and tasseled banner above all its compeers, and on the universality of its uses and its presence, founding a claim to universal sway. But the genius of American agriculture, whose vital principle is freedom, accords invidious pre-eminence to none.

It is in this catholic and parental spirit of equal regard for the agricultural interests and pursuits of all the States, that the national society of which you, Mr. President, are the honored representative and organ,

desires, I am sure, to exercise its fostering influence. It holds its great annual meetings in succession in each one of the States, seeks, in co-operation with the local societies of each, to stimulate and develop to its highest perfection, the agriculture of each, and embracing thus, in the grand cycle of its progressive revolution, all the members of the confederacy, it warms and vivifies them all, like the bounteous luminary above us, by the rays of its countenance and encouragement.

Nor is it by this premium list alone, or, indeed, in any noticeable degree, that this beneficent influence is exerted. It is by bringing together periodically, at one common point of re-union, the agriculturists of the different States, enabling them to compare, personally, their different productions, their different systems of husbandry, their different modes of culture, making them conscious how much these very diversities serve to unite them by rendering them mutual customers and tributaries to each other's wants, instead of jealous and encroaching rivals, that they are the children of one great and glorious country, engaged in the same pious effort to make it fruitful and prosperous and lovely, to whom seed time and harvest, the early and the latter rain, the palmer worm and the canker worm, bring the same joys or sorrows, and that they have only to know each other and commune with each other, to feel that they are brethren in sympathy and affection, as well as in interest and in duty.

There is one other effect of these periodical assemblages of the agriculturists of the Union, which I cannot forbear to notice. They are thus made sensible of their collective power and influence for good or evil, and of their consequent responsibility in all that concerns the destinies of the republic. If there be any class of citizens, more than another, constituted by nature and providence the guardians of a country, it is those whose daily pursuits and interests connect and identify them with the soil of the country, who are bound to the country by ties not readily or lightly dissolved, and who must meet, inevitably, whatever fortune, adverse or prosperous, may betide it.

Their tranquil employments too, in the constant presence and communion of nature, and remote from those conflicts of human passions which agitate more or less the crowded centers of population, prepare them, in an especial manner, for the calm and sober exercise of those controlling functions which, in republican governments, devolve upon the great body of the people. The history of republics, both ancient and modern, proves that the landed interest has, in all of them, been the conservative element by which only liberty and order could be harmoniously united. The convulsions and revolutionary resorts, of which some of our cities, within a few years past, have been the theaters, are beginning to teach the same lesson here, and may produce the conclusion that in America, as elsewhere, republican liberty, amid the storms and tempests to which it is exposed, will find its only safe anchorage, at last, on the firm foundation of the soil.

But however this may be, the agriculturists of the United States, all will admit, have a deep and precious stake in the common weal, and a highly important part to play in the public duties of the State. Without indulging the remotest jealousy of the other great branches of the national industry, a jealousy that would be nothing less than suicidal, for commerce and manufactures, are the acknowledged and indispensable handmaids of agriculture, it is incumbent upon them, at all times, to keep watch and ward over those public liberties and interests, on the preservation and due care of which their own welfare so vitally depends.

Patriotism is a plant then, whose growth should be encouraged by agricultural societies, along with those other plants which engage so much of their attention. It springs spontaneously in the heart of the farmer, and requires only light, and air, and free communication to give it its fullest development. It is in scenes like this that it grows and expands with fresh vigor, and we learn to love our country more, as we see how much it contains worthy to inspire a common sentiment of interest and affection. The mission of American agriculture is a moral no less than a material one; and if we shall go forth from this meeting, as I trust and believe we shall, penetrated with a just conception of our noble calling, in all its relations, fortified in our loyalty and devotion to our common country, strengthened and renewed in our social and civil affections, the week we have spent here together, in brotherly communion around the domestic altars of Virginia, will be among the proudest in her annals and be blessed with rich and enduring fruits to the cause of national harmony and union.

Friday evening the banquet came off, and a respectable company assembled—Lord Napier, Hon. Caleb Cushing, Mr. Lyons, president of the Central Society, and other gentlemen, were present. After refreshing the inner man from the well spread board of Mr. Ballard, the proprietor of the Exchange Hotel, General Tilghman, president of the society, rose and delivered an address, very well timed, and called upon Mr. McFarland, who, in behalf of the citizens, responded happily, and in closing alluded to Massachusetts, on whose behalf Mr. Cushing made a set speech, in which the *Union* was taken care of. On closing his speech, Mr. Lyons, President of the Virginia Central Society, followed, and made a very interesting address, and while regretting that so few of the citizens of Richmond were in attendance, he was gratified in being enabled to say, that so far as material aid was concerned, the fair had been entirely successful, much to the surprise or expectation of some, and as an exhibition was most creditable, and one of the best held at the capital of Virginia. He, in closing, alluded to the presence of Lord Napier, the representative of Britain's Queen, in very appropriate terms, and his lordship responded, and his speech, plain, familiar and agricultural in its character, was *the* speech of the evening, and showed him to be as intelligent as a farmer as he was distinguished in council or on the field of battle. He was followed by the President, having given as a sentiment, "The President of the United States

Agricultural Society," to which Mr. Tilghman responded, and gave "The Duke of Marlborough, President of the Royal Agricultural Society of England," and Mr. Johnson, Secretary of the New York State Agricultural Society was called upon to answer, in the absence of the respected President of our Society, Mr. McCoun, who had left town in the morning. After his remarks, Mr. De Bow, of Louisiana, Mr. Wilson, of Iowa, Mr. Smyth, of New Hampshire, and others, spoke, and the whole matter passed off very pleasantly. We are glad we attended this fair, though we found more work to do, somewhat, than we had expected, as so few judges were present, much work had to be done by those who were present, as delegates and judges, or it was plain to be seen it would not be done. The examinations was made with as much care as practicable, and the opportunity of seeing the sights of Richmond even, was mostly lost, though we did see some things, of which we made a note, and may give our reflections at another day.

There were some working men there that should not be forgotten. The President, Gen. Tilghman, and the Secretary, B. Perley Poor, were active and laborously engaged. Hon. Henry Wager, of our own State, chairman of the executive committee, had immense labor on his hands—but here, as everywhere, he shrank not from duty, and discharged it most promptly and efficiently. He was well sustained by other members present. Mr. F. Smyth, of New Hampshire; John Merryman, Esq., President of Maryland Society; John McGowan, of Philadelphia; Gen. Wilson, of Columbus, Ohio; Col. Ware, of Virginia. As judges, W. Duane Wilson, Esq., of Iowa; Gen. Sutton, Leander Witherell, Mr. Flint, Secretary of the Board of Agriculture of Massachusetts, and others from that State; President McCoun, C. S. Wainright, Vice-President of our Society; Hon. Benj. N. Huntington, of Oneida, W. S. McCoun, Long-Island, J. T. Grant, of Rensselaer county, and others, did good service in various ways. Mr. Spanger, of Philadelphia, Mr. Taggart, President of the Pennsylvania Agricultural Society, and several others from that State, were very active and efficient; some of these gentlemen serving on as many as eight committees. Gentlemen from South Carolina, North Carolina, Georgia and Virginia, also, were prompt to the calls of the Executive Committee for aid in supplying vacancies. From Maryland, Mr. J. Howard McHenry, Mr. O. Bowie, and others, did good service. Had not this aid been secured much would have remained undone. We would respectfully suggest, for the future, that more care be taken in selecting judges, and that, before any names are announced, the executive committee have their consent to act, and their determination to attend, if no obstacle unexpected prevents. It would have added much to the pleasure of this exhibition had there been a full attendance of the three hundred judges, instead of only some thirty or forty.

Mr. Wager, Mr. Smyth and Mr. McGowan, remained at Richmond, with the president and Secretary, to pay off the premiums and close up the concerns of the fair.

To the president and executive officers of the Central Society, great credit is due, for the prompt and efficient manner in which they discharged their duties. To the marshal, Col. Dimmock, too much praise cannot be rendered, for the efficient manner in which all the arrangements for the fair were carried out—he will long be remembered by those in attendance, for his kind and courteous demeanor, and prompt and ready answer to every demand made upon him—and we desire personally to tender our thanks to Mr. Lyons, the president, and Col. Dimmock, for the many attentions and favors received, which we shall be glad of an opportunity to repay. We much regret that our engagements prevented us from accepting invitations to dinner from several gentlemen of Richmond, which it would have given us great pleasure to have enjoyed.

The following prizes were awarded to exhibitors from this State:

Horse Powers—1st premium, Emery Brothers, Albany.

Thrasher and Separator—1st premium to the same firm.

Combined Reaper and Mower—1st premium to T. D. Burrell, of Geneva: 2d, to R. L. Allen, of New York.

Reaper—1st premium to R. L. Allen, New York.

Fanning Mill—1st premium to J. T. Grant & Co., Rensselaer county.

Grain Cradle—1st premium to the same firm.

Portable Farm Engine and Forest Saw-Mill—Special premium to Fairbanks & Co., Brooklyn.

Of the general results of this fair, we believe it will be useful and profitable to Virginia, and to all who attended it with a desire to be informed. There was much that was new to that section of country—and from the purchases made of stock and implements, before we left, there can be little doubt that this exhibition will widely extend its influence for good. We made a personal acquaintance with many gentlemen from the South, with some of whom we had long enjoyed a correspondence; and were especially gratified with the information we received of the manner of farming in the South—and we are pleased to be assured that there is a very manifest improvement in the farming of Virginia, North and South Carolina, and in Georgia. Benjamin Allston and Dr. Joshua Ward, from South Carolina, Wm. C. Johnston and his uncle, Mr. Johnston, from Georgia, we found very intelligent gentlemen, connected with extensive estates, and desiring every practical information to enable them still farther to improve. Most, if not all of them, made purchases of South Down and Long-Wooled sheep, and Devon cattle—and their purchases were made with discrimination, and will add much to the stock of the State. There were quite extensive sales of stock, and many more would have been made had the animals desired been on hand for sale. Of implements there were many sold, and an anxious inquiry was made for implements which were not on exhibition, especially the Michigan and other improved plows, which would have found ready sale.

One of the "Casey" breed of cattle, imported by Lieut. Lynch of the

Navy, from the district of country around the Red Sea, was on exhibition, owned, I think, by Mr. Mason, of Virginia. He was a dark brown with slender short horns, very large, and his limbs very long. Seemed to be well made, and from the description given was well adapted for work—said to have great endurance, and a gait equal to the very fastest walking horse. I regret that there were not more upon the grounds, that a better judgment might have been formed of them. Mr. Peters, of Georgia, who has been breading the Brahmin cattle, thinks the cross of a Brahmin bull on the common cow produces an animal much like that exibited—and he infers the probability at least, that the animals imported by Lieut. Lynch were a cross of the Brahmin bull upon some of the stock of the country. The grade Brahmins in Georgia make first rate bullocks for the yoke, and are remarkably well adapted to a southern climate, and have a speed upon the road equal to the best team horses, and will stand heat better than any other animal used for service.

At the Royal Agricultural Show at Windsor, in 1851, we saw a fat grade ox, from Lord Derby's Brahmin bull and a Short Horn cow, which was a very fine animal, and resembled, as we recollect, very much the one shown at Richmond. He was very leggy, which was the main objection to him. He fattened well, was a fair handler. We should like to know more about these cattle. The Brahmins in Georgia were from Lord Derby's stock, imported by Dr. Davis, of South Carolina.

We were much interested in the examinations of machinery for farm purposes by the committee, of which we were a member. There were four farm engines on the grounds, of from twelve to sixteen horse power, three of which were entered for competition. They were all well made engines, and the exhibitors professed to have made improvements upon their former engines, and described the claimed new features, some of which were real improvements. The engine of Philip Rahm, Eagle Machine Works, was a very compact and useful one, and which has had very extensive use among the planters of the South. His arrangement of his heating tubes in a circle was different from the others, and his spark arrester and the arrangement for heating the water before it was poured into the boiler, seemed well adapted to prevent danger from explosion or fire. Mr. Rahm was the architect of his own fortune, as we were informed by one of the editors of the Enquirer. From a journeyman in a machine establishment, he, with little capital commenced for himself, and has now, after about fourteen years labor, as we understood, among the most valued and extensive establishments at Richmond, supplying engines to all the Southern States and to Brazil. His engines are not complicated, and after a few days instruction the hands upon the plantation, we are assured, manage them without trouble. The three engines examined were very good ones. The Society's Gold Medal, 1st prize, was awarded to Mr. Rahm—a Special Honorary Diploma to the other exhibitors.

Annexed we give the remarks of Lord Napier at the banquet, in reply

to a toast by Mr. Lyons, the president of the Central Agricultural Society of Virginia.

Gentlemen—When I rise to address the great assembly which has remembered my sovereign and my country, and done me the honor of recognizing my presence at this festival, I reflect with satisfaction that however ignorant of the noble industry to which you are devoted, and however incapable of justly appreciating the efforts and services which you are rendering in its cause, I may still rank myself, though in a subordinate order, among the true sons and votaries of the soil. I remember with pleasure that my father was an unsuccessful farmer, though a successful writer on the art of farming. I belong to a class whose interests and affections are deeply rooted in the land—a class whose active age is much bestowed on the business of Parliament, or negotiations, or civil government, or on the profession of arms, but whose thoughts in all the vicissitudes of life and strife, still repose upon fields and sports, and who ever dream of a late return to the hereditary home.

Notwithstanding this foreign vagrancy and diplomatic desertion, I remain a member of the Highland Society of Scotland; and, however incredible it may appear to you, I am president of the Pastoral Association of my native country for the improvement of the breed of sheep. With such instincts and associations you will believe that I do not feel altogether a stranger here, and that I am deeply gratified by the hearty welcome that I find from the brotherhood of agriculturists, in which I claim to be an affiliated, though at present an unfruitful member. The husbandry of America presents in its vast extension and rapid progress a spectacle to which no Englishman can remain indifferent. History offers no example of this swift, resistless, unceasing encroachment of skilled labor over the vacant and fertile dominion of the savage and the brute. It is the first triumph of man, equipped with all the accumulated powers of experience and invention, over nature in her largest limits and her most gracious and bountiful conditions. In the agriculture of the United States we see with exultation a beneficent and spontaneous procession of industry, of which the field is the American continent, and of which the implement is the Anglo-Saxon arm.

Such a reflection might alone furnish to my country many motives of thankfulness and pride, but it is equally certain that the agriculture of America forms one of the principal foundations of the existing prosperity of Great Britain. In the three great staples of cotton, grain and tobacco, imported from the United States, we recognize an indispensable material for our manufactures, a main element in the food of our people, and an important basis for the revenue of the State. While the agricultural products of the United States contribute in a high degree to the resources and power of our government, and to the welfare of the industrial community, the land and labor markets of America offer to our superabundant population an inestimable refuge in periods of distress. By this convenient issue the burden of domestic taxation is lightened, our public peace is confirmed,

and our political institutions are defended against those disturbances to which they might otherwise be exposed from the passions of men without the means of regular support, and without the hope of prospective improvement. Surely, gentlemen, there is no event in the circle of human actions more pregnant with moral interest, than the departure of a humble family from their birthplace to settle in a strange country. It is a subject on which the poets and painters and teachers may well exercise their genius, for it is ever touching and ever new.

For my own part, I draw my impressions from the life, and I am the more disposed to revert in fancy to those scenes, for there I find my first associations with America. Belonging, as I do, to a district of Scotland in which the aspiring peasantry have long been sensible of the benefits attached to emigration, the earliest recollections of my childhood are mingled with the pathetic but hopeful pictures of our people forsaking the rude hearth and the gray skies and the familiar field of toil, and turning their thoughtful faces towards the Western World, at once advancing their own condition by the enterprise, and opening a more generous sphere of labor and of gain to those who stay behind. All the features of such an incident are still present to my memory. There is the stormy dawn of morning on the moor, and the mist trailing on the mountain tops; there is the crumbling cottage, with its smokeless chimney, for the fire of many lives is quenched. I see the gathered neighbors, muffled in their plaids, the restless sheep dogs, and the useless burden of domestic goods; I see the helpless infant, the submission of decrepit age, the suffering wife, reluctant but resigned to go, the elder children pleased with the unwonted tumult, the father grave and firm; then the long partings of those who will meet no more till all the weary are at rest.

And thus they pass forth, poor, and but half aware of the high mission they fulfil, yet bearing mysterious destinies and the unseen blessings of the promised land, and overshadowed by the Almighty Power who silently impels them on their distant course.

While recognizing all the importance of the land and agriculture of the United States to the social welfare of the British empire, I cannot deny myself the pleasure of expressing to you the interest which, as a mere virtuoso in rural matters, I have taken in the external aspect of American husbandry. In some respects the prospect is indeed often unsatisfactory to the English eye. In the new parts of the country the primitive graces of the landscape are ruthlessly violated, while the artificial trimness to which we are accustomed has not begun. We mourn over the blackened and girdled giants of the forest, each of which would be the sylvan manor of an English homestead; our fastidious taste complains that the furrow is not straight, that the wheat is not clean, that the swamp is not drained, that the sward bristles with obnoxious stumps; then there is a general absence of root or green crops, and we discover a great deficiency of sheep.

In the regions which have been longest under the plow, the vital forces

of the soil seem to have been frequently overtaxed; the more valuable cereals are abandoned, and here and there the wilderness resumes its sway. It requires but little reflection to show that these phenomena are the natural and transitory concomitants of the first epoch of tillage, which is hasty, pittiless and impoverishing. On the other hand, I remark that in many portions of the Union there are extensive tracts which would be considered opulent and well ordered in any European kingdom. In the absence of turnips, potatoes and mangel-wurzel, the English traveler is gratified with the spectacle of the Indian corn, tobacco and the vine, and, further south, by the cotton plant, the rice field and the cane, all magnificent and lucrative productions unknown to British husbandry. There is also a greater abundance of fruit trees. The breed of horses equals that of the mother country, except, I think, for the purposes of heavy draft, and the various races of cattle, replenished by importations of the best blood of England, will be propagated without degeneracy, and will prove formidable rivals to the parent stock.

In a country where human labor is exorbitantly expensive, the greatest ingenuity is exerted in the improvement of tools and the invention of mechanical aids and substitutes, and in this respect the triumphs of American contrivance are not only profitable at home, but are recognized and adopted by foreign nations. Much, gentlemen, has been accomplished, and the future will furnish still higher results. If we regard the dissemination of intelligence, the diffusion of taste for rural pursuits, the increased application of capital, the scientific inspection of soils, the discriminating use of manures, the development of the home market, and the general establishment of competitive exhibitions, we may safely affirm that American agriculture has entered upon a period which will not only be reparative where the past was exhaustive, but which will gradually carry the land in every quarter to a high pitch of productiveness and beauty.

Mr. Chairman and gentlemen, her Majesty the Queen will be gratified in learning that her character and dignity are held in honor in this ancient commonwealth, which owes its foundation and its name to the most illustrious of her predecessors, and which was long connected, by peculiar ties, with the loyal houses and the throne of England. It has been asserted by a historian of our great rebellion, in the seventeenth century, that in the outset of the conflict the question of right was so uncertain that an honest man might have taken part with either side. It may be added, that while we recognize the virtues of both factions in misfortune, we cannot exonerate the ascendancy of either from reproach.

In the fluctuations of that struggle the continent of America was open to the victims of alternate tyrannies, and gave an impartial welcome to the persecuted Puritan and the proscribed Cavalier; but the sovereigns of England and those who descend from the adherents of the royal cause, should not forget that the exiled survivors of Marston and of Worcester rebuilt the ruined altars, and restored their ravaged halls in the hospitable

bounds of the Old Dominion. Gentlemen, long may Virginia flourish, and while she preserves the traditional virtues of an open hand, and a warm, courageous, patriotic heart, may she attain that industrial prosperity to which she now aspires, and of which nature has bestowed on her the abundant element.

RHODE ISLAND SOCIETY FOR THE ENCOURAGEMENT OF DOMESTIC INDUSTRY.

Reported by HENRY KEELER, of Westchester county, Delegate to the Rhode Island Society.

B. P. JOHNSON, Esq., *Secretary, &c.:*

Your note informing me of my appointment as a delegate to the fair of the Rhode Island Society for the Encouragement of Domestic Industry, to be held at Providence, September 14 to 17, was duly received, and in accordance with your request I attended the fair, and submit my report, as desired by you.

I arrived on the 15th, and as my engagements limited my stay to a single day, my report will be less full than it otherwise would have been. On my arrival at the spacious rooms connected with the railroad depot, I presented my credentials to W. R. Staples, Esq., the gentlemanly secretary of the society, who presented me with every necessary facility for the examination of articles on exhibition, accompanying me through the rooms occupied by the society.

Although Rhode Island does not specially boast of being an agricultural State, yet the show of implements was very creditable, displaying many valuable ones. Of fruits the exhibition was good, embracing not only the ordinary products of the orchard, but the best display of hot house grapes, that was truly magnificent, reflecting great credit not only upon the growers but also upon those who had arranged them in so attractive and tasty a manner.

The samples of grain on exhibition were excellent, though not very numerous, and a very fine show of vegetables. Fine potatoes were on exhibition, although the potatoe disease was very destructive the present year. A basket of sweet potatoes, raised in the vicinity of Providence, were very attractive.

The exhibition of cattle and horses was very creditable to the State; the working oxen excellent; several thoroughbred bulls on exhibition, and a cross upon the native stock, I was informed, furnished them with excellent dairy cows and first rate steers for the yoke, as was manifest from those on exhibition.

The rooms where the implements and domestic manufactures were shown were the great attraction, and were crowded continually to their utmost capacity. One feature of the fair may well be imitated by other societies: The manufacturers of the State exhibited their wares and goods in the

same style in which they are prepared for market. These articles were to be disposed of at the close of exhibition, thus making the exhibition in this particular a *fair* similar to those of the Old World.

One of the exhibition rooms was devoted to a variety of miscellaneous articles, among which was the spinning and carding frame that were used by Samuel Slater, the father of cotton spinning by water, and were the first ever made for that purpose. They were operated a long time successfully under his supervision.

"King Philip's kettle," the celebrated Indian chief, familiar to every reader of the early history of our country, was exhibited by one of the descendants of the family of Col. Church, who was the conqueror of the celebrated Indian chief.

A scythe and snath, brought from Europe by Gov. Dyer, which was bought of a farmer in Chamouni, one of the celebrated valleys of the Alps, in 1856, and was an object of great interest. It was rudely constructed, and showed that the implements of agriculture there might be much improved. It was a very salutary lesson to those who contend that no good has been done by our agricultural associations. On comparing this rude implement with the finished ones of our country on exhibition, the contrast was so great that even the most incredulous was constrained to say we have advanced beyond the old world, and they might with equal propriety also have admitted that our implements of the present day are a very great improvement upon those of twenty years since.

I regretted that I could not have spent more time at the exhibition, but short as my stay was, the time was most agreeably and profitably spent, and to the officers of the society I most respectfully tender my unfeigned thanks, for the kind attentions shown me as the representative of your society.

HENRY KEELER.

September 30, 1858.

ROOT GRAFTING.

We give the annexed statement on the subject of Root Grafting, furnished us by A. H. Ernst, Esq., of Cincinnati, as deserving attention.

W. F. Stoms, Esq., *President Cincinnati Horticultural Society:*

Noticing the published report of a discussion before the Society on *Root Grafting*, and feeling some interest in the matter, you will indulge me with this mode of expressing my views, as I cannot be present at the meetings of the Society to do so in person.

The declining health and longevity of the apple tree has for some time elicited considerable discussion; furnishing a fruitful source for speculation and theorizing on the cause of this deterioration of the *tree* and its *products* of late years. That the whole subject is surrounded with deep interest, and that it hence deserves our serious attention, all must feel.

We see that the tree, in many locations, is no more the long-lived and perfect fruit-bearing tree that it once was. The old and first planting are disappearing from natural causes of age. The more recent planting are often feeble and defective in the vital force of *former days*. These are lamentable truths; and how to account for them, and the discovery of the remedy, are questions of the deepest moment. That there should be great diversity of opinion on the subject is quite natural.

In attempting to solve the mystery, and fix on the cause and the remedy, we must take a general view of the change of circumstances which surround the matter, including unusual severity of temperature, as also excessive drought, to which our trees have been subjected within the last few years. Examine well our premises before we build a theory on it, as of general application. In the effort to fix it on root grafting, its advocates lay great stress on the seat of life, which is said to exist at the nucleus formed by the embryo of the seed, from which the ascending and descending axis proceed; hence grafting on divisions of roots taking from below this point, is the cause of the sickly and enfeebled condition of so many of our trees. Now, if the abuse of the practice of root grafting involved the whole cause of deterioration, it might be well to discard it, and trouble ourselves no further about the matter, but it is surely not wise to make it a scape-goat for all our mistakes and misarrangements, as well as for causes over which we have no control.

On looking at the argument in a philosophical point of view, I fail to see, and cannot understand the difference as to the effect (for propagating purposes) between a division of the descending or ascending axis, or, in other words, the difference between the vital force of the *root* or the *branch*, supposing each to be sound and healthy. Each is an integral part of the tree, capable of emitting roots or branches, and forming independent trees, when placed under proper circumstances. The two are precisely *parallel*. If one may produce the enfeeblement the other may, and of this there can be no doubt. The health of each is essential to the other, as is their united durability. However *entire* or healthy the root may be, it cannot *renovate* an impaired constitution of that which is placed on it, any more than a healthy graft can infuse vigor into a deceased root. Its simple office is to communicate between the earth and the top, with no power to change the character of what is placed on it, let that be what it may.

Each maintains its independent, individual characteristics as fully as if not united. This principle we have fully illustrated in the union of the quince and the pear. Yet, although this is a truth, the root cannot live independent of a top, any more than can the top without a root. They are mutually dependent on each other for existence. And to this end it is vitally important that each should be healthy and of vigorous constitution. If we take a well-matured graft from a tree with a strong and healthy constitution, and unite this with a division of root taken from an equally healthy, fully matured young tree, with proper lateral rootlets, they will

form at the point of union a nucleus from which roots and top will radiate, each discharging their proper functions as fully as if grafted on the entire seedling, and will live as long.

When the opponents of grafting on divisions of the root call it a violation of a natural law, and base their theory on this as the cause of the unhealthy condition of our trees, they should bear in mind that the whole system of grafting, as also the improvement of fruits, by crossing and hybridizations, is the work of art, and contrary to the natural courses of reproduction. The intended effect is to refine and improve our culture as well as the quality of our fruit; and this is admissible on that ground. No complaint is made of the deleterious effect sometimes produced on the health and vital force of the tree in the improper crossing of varieties, in the effort to improve the quality of fruit from seed, and cutting up the whole top of such trees for grafts. It seems not to occur to them that this has anything to do in the matter.

In discussing this subject we must not confine ourselves to the root. We must go beyond it, take in the wide field of natural reproduction and its artificial substitute in all its bearings. Look at the original office of the tree, which is the production of seed for the reproduction of its species. To this end its vital forces are directed. The seed is hence fully matured and perfected, and their product is hardy, healthy and long-lived. When stocks grown from seed of such trees are used to graft hardy and vigorous sorts on, we may reasonably expect a tree of health and some endurance of life. As we depart from the original office of the tree, and advance in the improvement of the quality of the fruit, the seed becomes flattened, elongated, less perfect, and incapable of reproduction with the same vital force as in a natural condition. This sometimes extends to an utter extinction of the power to vegetate. The product of such seed are mostly porous and spongy in the texture, and are not capable of enduring the amount of change and severity of temperature which those grown from more natural fruit are.

The original office of the tree is diverted from the mere production of seed for the purpose of reproducing its species, to that of forming a *pulpy, luscious fruit*, to which its energies are directed, and not the seed. When we use stocks grown from such seed to graft our better varieties on, from trees which are proportionally delicate in texture and vigor of constitution, and expose them to a temperature such as to the two winters between 1855 and 1857, and the excessive drought of the intermediate summer, we must not be surprised at the result of what we see around us. To these causes more than any other is the sickly condition of our trees owing.

Of course it can make no difference in the power of resistance, if we use the entire root of such plants to graft on; it will not make them more hardy. That such stocks are extensively used will not be disputed. Be this, however, as it may, it is nevertheless *true*. Were this the proper place I might enlarge, and also show how intimately *fire-blight* in the pear, *mildew* and *rot* in the grape, are connected with our system of propaga-

tion, &c. But I think for the present, this is *striking* at the whole *root* of the difficulty and not at its *divisions* only.

Respectfully,

A. H. ERNST.

SPRING GARDEN, CINCINNATI, *Dec.* 24, 1858.

AGRICULTURE IN EUROPE.

LETTER EROM GOV. WRIGHT.*

BERLIN, *August* 6, 1858.

My dear sir—After an absence of a few days among the best farmers and agricultural schools of this country, I comply with my long neglected promise. I had not time to visit Belgium, nor the most southern districts of Germany, where, it is said, agriculture has reached a great degree of perfection. Should such an opportunity occur, you shall hear from me again.

Most interesting was my visit to Hohenheim, the great agricultural school of Europe. Its name, literally, the *high home*, derived from its position near the summit of a lofty hill, about eight miles from Stuttgardt, in the Kingdom of Wurtemberg, suggests at once the ennobling and elevating character of its influence upon all houses that come within its range. An institution where young men of all ranks and conditions of life, from the son of the poorest peasant to the heir of a kingdom, are thoroughly, practically and scientifically instructed in those pursuits upon which the essential prosperity of every country depends. I have thought that a brief sketch of its history and its plan of instruction might furnish some useful hints and interesting facts to the farmers of our own State, to whom everything connected with the progress of agriculture has an importance which cannot be too highly estimated.

The estate of Hohenheim was anciently the possession of a noble family bearing that name, and in the progress of time fell from one hand to another, until, in 1768, it became the property of Duke Charles, who enlarged its area, built a handsome modern palace in place of the old castle, and devoted the greater portion of the grounds to agricultural experiments. As a historical fact worth remembering, it may be stated that Duke Charles was the first person in Wurtemberg to make a practical application of lightning rods to buildings. Under his sagacious and well directed supervision, Hohenheim became one of the most celebrated farms, if I may apply that word to a princely estate, in all Europe; but after his death it was neglected and gradually reduced to a condition of most deplorable ruin. The palace was deserted, and rapidly fell into decay. The splendid orchards, the fields of grapes and grain, the establishments for rearing of cattle, upon all of which the Duke had lavished the extremest care, were suffered to lose their high rank, and degenerate to the standard of the agriculture of the peasantry.

* This letter was addressed to Indiana, and a duplicate sent to our Society.

But in 1817, when the Agricultural Union was founded, and the necessity of a high scientific institute for the kingdom of Wurtemberg was apparent, King William, the present ruler, who has devoted himself to the improvement of the agriculture of his State, determined to raise Hohenheim from its fallen condition ; and though it no longer attracts the wonder and admiration of the traveler by princely magnificence, yet as an institution whose object is the promotion of the physical and moral well being of the people, it has won, both at home and in foreign countries, a second fame more enviable and enduring than the first.

As at present organized, the Agricultural School at Hohenheim comprises five hundred acres of cultivated soil, and more than five thousand acres of forest. The rooms in the old Ducal Palace have undergone a genuine democratic transformation into lecture halls, cabinets for various collections, students' apartments, and the like. There, under the direction of twelve professors, selected from all parts of Germany, for the eminence of their scientific and practical attainments, from one to two hundred young men devote themselves to the study of agriculture and all the various branches of knowledge theoretically or practically connected therewith. Practical instruction is given in such a manner that each student becomes thoroughly learned in all the departments of knowledge comprised under the general term, agriculture. But as each pupil must necessarily master all these departments within three years, it is necessary to pursue a certain fixed course of instruction for the gradual practical education of the agriculturist. Hence his first year is devoted to the simpler and lighter duties of the farm, such as fall to the lot of our " chore boys," gradually proceeding to the harder and more important, such as the preparation of compost, the sowing of gypsum, haying and harvesting, and the like. The second year he learns to manage oxen, to plow, and is obliged in addition to take the whole charge of his team. In the intervals of his severer labors, he must pay attention to the culture of trees, to the storage of different kinds of grain, &c., &c. The third and last year is devoted to the management of the horse, to heavy plowing, to the application of the most improved machinery to farm labor, to sowing, and all the higher departments of agriculture. In the course of this year opportunity is afforded for learning the manufacture of sugar, the most improved methods of brewing, &c., and the construction of machines and tools. To conclude the course of practical education, those pupils who have made satisfactory progress are appointed overseers of the under-scholars, and thus have the best opportunity to test the worth and thoroughness of their own culture.

The theoretical department of the school is perhaps the finest in the world. Everything is experimentally demonstrated, and no result is officially announced until careful and repeated experiments have determined its soundness. In connection with studies immediately relating to agriculture, the pupils are instructed in mathematics, mechanics, mineralogy, geology, botany, chemistry, political economy, &c.

In all the departments of the school theory and practice go hand in hand.

The students not only learn the *how*, but the *why* of every operation connected with agriculture. For example, while learning the practical management of the horse, they must study his whole anatomy as thoroughly as medical students study the anatomy of the human frame. The professors illustrate their lectures from skeletons, stuffed specimens, and the most perfect artificial models that can be procured.

My introduction to this celebrated institution was the hearing of a lecture by Professor Rau, on the manufacture of cheese. I have just remarked that theory and practice in this school go hand in hand; and here was a good illustration of the principle. Sixty gallons of milk were placed upon the fire when the lecture began, and the whole process of cheese-making was theoretically explained and practically developed. Fifteen young gentlemen, one of them, if I mistake not, the son of a Prince, listened for more than an hour to the Professor's interesting exposition. The lecture was enlivened by pleasant remarks growing out of the subject, and in the course of it the Professor took occasion to combat the idea that English grass, English air, or English fogs, combined or severally, are essential to the manufacture of good cheese. He insisted that good milk and a right understanding and application of the best methods, are the only essential conditions in the making, though age is necessary to bring out the finest flavor. If well made and properly cared for, he remarked, cheese will keep good for half a century. It was formerly the custom in parts of Germany, to commemorate the birth of a child by the manufacture of an immense cheese, which was then buried, and kept to be eaten only when the son or daughter to whom it belonged should be married.

From the lecture room I passed, under the guidance of Professor Rau, to the silk rooms, kept solely for experiments, as the silk worm does not thrive in this climate. Thence I went to the cabinet, where models and specimens of farming implements, of almost every age and description, are to be found. I saw a very curious series of plow models, from the rudest wooden machine of old Roman times, to the latest improved pattern of Starbuck & Son, of New York. The collection would remind you of the Patent Office, in Washington.

After passing hurriedly through various collections of stuffed specimens of wild and domestic animals, of different kinds of wood, of curious fabrications. I took a rapid survey of the experimental fields, where all manner of agricultural problems are attempted, such as the effect of this or that soil upon every kind of grain; the effect of different and successive crops upon the same soil; the method of culture best adapted to each several crop, and so on to the end of the list. I cannot undertake, within the limits of a single letter, to enumerate all the different crops which I saw growing side by side in these fields. There was Turkish tobacco, Maryland tobacco, Indian corn, many kinds of grain peculiar to our country, either mixed or in separate lots, or intermixed. These fields are subject to the most careful attention. Every circumstance of growth, success or failure, is noted with great precision and caution. Only after three, four,

or even five experiments, when there seems to be no room for uncertainty or probability of mistake, do the directors of the school allow the results of their labors to go forth to the world. Any change from old, well established usage is regarded with suspicion. Not a fast people, moving slowly, quietly, and firmly, the Germans dislike the hazard of frequent experiments. Most of their farms are so small that the loss of any part of his crop would be a matter of serious importance to a German agriculturist. Hence no results are communicated to the people from the model farm, to which all classes look up, until their perfect utility can be practically demonstrated.

In the spacious stables connected with the school are kept forty milch cows. The management of them is peculiar. They are never let out, even to water, but stand the year round in their roomy, airy stalls, where they are regularly and systematically fed and tended. I was assured that by many experiments it had been ascertained that the best food for milch cows during the summer and part of autumn, consisted of cut oats, peas and vetch, raised together and given to them green, as we feed blue grass and clover. Some of these cattle were the most noble specimens of their species I have ever seen.

One thousand sheep are kept upon the farm, principally for their wool. By many careful and minute experiments and calculations in regard to feed, it has been ascertained that the profit realized upon every hundred pounds of hay fed to sheep, is thirty kreutzers, (about twenty cents of our money,) while upon a like amount fed to cattle, the profit is only twenty-four kreutzers (about sixteen cents); demonstrating a profit of about twenty per cent in favor of sheep as compared with cattle.

Is it not a strange fact that our people do not devote more attention to the raising of sheep? By the last census it appears that the number of sheep in our State is less than a million; and if I remember right, one-half of the entire value of the live stock of Indiana, according to the census of 1850, at that time consisted of the value of hogs. But if, in this country, sheep are more profitable than cattle, how would it be with us, where land is cheap, and where our well fenced pasture grounds would enable us to dispense with the services of the shepherds? It has been well said of the sheep, that he never dies insolvent; his fleece will always pay his cost; his manure is better than that of other animals; he destroys briars and thorns, and in every respect exerts a good influence on the character of vegetation. Wherever he runs wild grass disappears, and his sure productiveness always make him a source of profit. With our immense possessions, an extent of territory a hundred times larger than Great Britain, more than sixteen times as large as France, larger, by more than twelve times, than all Germany; and with such a large proportion of this territory well adapted to sheep grazing, is it not most absurd and wicked that we should continue to import wool to the amount of millions of dollars from those countries, instead of raising it within our own borders?

Great attention is given at Hohenheim, and indeed throughout Germany, to the preservation of the manure and offal of the country. On the

"Rothchild Farm," an estate of about 1,300 acres, near Frankfort on the Main, one-fourth of which is in grass lands, I found that about 1,200 gulden are expended yearly for city offal, which every night is hauled out in large hogsheads. The Batman farm of 500 acres, also near Frankfort, pays a large sum for the blood from the slaughter houses, and in addition is annually enriched with 300 loads of manure. Here it may be stated that Napoleon has laid out twelve additional farms about his military camp at Chalons, in order to turn the little manure and offal of the horses to the best practical account.

In this country, as every where else, the great problem for the agriculturist is this: How to obtain the best manure at such prices and in such quantities that the poorest land may be made profitably productive? In some districts of Germany, however, the soil is so peculiar that even manure will not combine with it, without the co-operation of other agents. Thus the common *lupine* which grows luxuriently in many parts of our country, will not only flourish upon sandy plains, where even thistles would die, but impart to, or develops in the soil a property which enables it to receive nutriment from manure, and thus be prepared to support potatoes, grain, and other crops. It has been discovered also, that forest trees have the fertilizing property; and accordingly, whole districts may be seen in Germany covered with a low growth of pine, chestnut, or oak, where in a few years the golden harvests will wave and ripen in the sun.

From the manner in which the Germans preserve and improve their forests our countrymen might take a valuable lesson. At Hohenheim this forms one of the most important departments of study. The pupils are instructed in the best method of preserving, propagating and improving their forest trees, while at the same time a proper estimation of the pecuniary and moral value of these noble productions of nature is instilled into their minds, which must eventually become the common sentiment. Our people must give attention to this subject, sooner or later, and every day's neglect of this practical science will entail evils upon us, for which years of labor will hardly make amends. We do not, as a people, appreciate the value of our forests. Negligently, carelessly, and wantonly, we are destroying them on every side, not considering that in them lies a mine of untold wealth; for the time comes, with every people, when they can turn their own natural productions to the most advantageous use for themselves, and this law applies as firmly to trees as to the coals and various mineral ores. Yet what destruction of the best and most valuable timber have you and I witnessed during the past forty years in Indiana! A statistical statement of the pecuniary loss would astonish the reader, to say nothing of the loss of health and domestic comfort. The connection of family health, enjoyment and comfort, with a grove of primeval forest trees about the homestead, never entered the practical heads of our fathers; and their sons, true to the example before them, pursue the same suicidal course. Down come the lofty oaks and beautiful maples, leaving the homestead to

parch, and the spring to dry up in the scorching rays of the sun. If there are exceptions here and there, you will find the value of the farm increased a thousand fold, simply because the trees have been let alone; but what if they are cultivated with the proper care? All along the line of the railway in Southern Germany, I saw acres and acres of forest trees, from ten to fifteen and perhaps twenty years old, planted in rows as regularly as corn is with us, and all cultivated in the most scientific manner. When will our people learn wisdom in this matter? will they need the warning of the old world, listen to the admonitions and counsels of science, and be prudent in good time, or will they wait to learn it, too late, from their own experience? We certainly, who boast so freely, and with good reason, of our practical foresight, should take shame to ourselves to be surpassed in this important matter by the Germans.

Writing of trees reminds me of another peculiarity of this country, from which *Young America* might learn an important lesson. Along the public roads, for hundreds of miles, are rows of fruit trees, unprotected by ditch, hedge, or fence, yet the ripe fruit might hang in profusion on their boughs, or cover the very roadside, and not an apple or pear will be purloined, not a cherry twig will be broken. Frequently some poor man buys the fruit of one or more trees for a season. All he must do to have it sacredly respected is to bind a withe of straw about the trunk, in token of ownership. This may remind you of an amusing incident connected with some cherry grafts in the Governor's garden.

To return to forest trees. In some portions of Germany I have seen efforts made to introduce foreign trees and shrubs, with a view to the improvement of the scenery. You have witnessed the same thing in America. Generally these efforts have ended in failure. The operation is too expensive and precarious, and questionable as a matter of taste. Many a large mansion around which native groves would flourish, is surrounded by ill-looking, half-preserved foreign growths, to which the climate and soil are alike injurious, and which give an air of decay and meanness to the whole. Let our people not attempt to ape the bad usages of other nations. Rather than waste time and money in the importation of unsuitable foreign trees for the decoration of our grounds, let us improve our own forests, fields, meadows and pastures. With tastes cultivated by study and directed by experience, we shall find within our own borders all the materials wherewith to enrich, adorn and beautify our *homes*. There is nothing that dignifies, beautifies and adds to the comforts of a country residence, so much as the tasteful preservation of the primitive forest around the family mansion.

We should look to the preservation and improvement of our timber lands, as a question of high pecuniary interest. Every nation has its own distinguishing branch of industry, trade or manufacture; England has her own, France another, Switzerland still another. Let us remember that it is our province to exhibit the results of a bold and peaceful industry, the true wealth of the nation. In the workshop, in our gigantic steamers, in our

house and furniture, in all kinds of machinery, lie one of the great sources of our national prosperity. For these we are, and ever must be dependent upon the preservation and improvement of our forests, and we should all exclaim with one voice:

"Woodman, spare that tree!"

But to return to Hohenheim, the high home! It is now a university, the oldest and most distingushed of its class in Europe, and is under the direct patronage of the king of Wurtemburg, who takes an active personal interest in its success. At this institution a young man can live comfortably, and enjoy all its advantages, at an annual expense not exceeding four hundred American dollars. Connected with the school is an admirable agricultural journal.

With schools and universities in our country, of perhaps equal merit, Hohenheim has many claims upon our attention, not only for its renown, but for the comparison of the systems of agriculture which prevail in the old world and the new. We should prove all things, and hold fast what is good. Discarding both old prejudices and new ones, we should make every minute count as one more step forward in the march of agricultural improvement. Would that I could induce some of our young men, who waste too much of their time in Europe in mere pleasure and profitless sight-seeing, to devote a few months and years to the noble studies pursued at the *high home!* In this way they might do good service to the agricultural interests of their country, something towards investing practical labor with scientific interest. Nor is this all. It is written, man shall not live by bread alone. It is not enough that we have plenty to eat and drink, fine clothing, comfortable houses, and productive farms. Every man owes it to himself, his family, and his country, to cultivate all those qualities of mind and heart which delight in beautiful objects, which are susceptible of moral and religious growth. And as *home* is the cradle of all virtues, and as external adornments, especially those natural ones which lie within the reach of every citizen of our favored land, such as trees, shrubs, flowers, tasteful lawns, arbors, and trellises, are among the strongest means of making home attractive, it should be the desire and the labor of all good men to diffuse throughout the community a sentiment of regard for rural works and pastimes. To do this lies within the power of no one man or woman; all should make it their object, and he who labors most will have the satisfaction of knowing that he has faithfully done his part towards accomplishing the great work of the age.

Man must work, he must labor. But he may work willingly, or as a machine; he may work cheerfully, or as a slave. Labor, undirected by knowledge of the great principles which govern the development of the soil, is always slavish. It is the grand design of agricultural schools, to to lead the tiller of the soil to take an intelligent interest in all the wonderful processes of nature which continually pass before his eyes, in order that, with his powers of observation thus quickened, and all the better faculties of his mind aroused and exercised, he may make every hour of

labor attractive, and add new grace, refinement and happiness to his *home*.

The nation must look for true wisdom and strength to the education which controls and shapes the *home* policy of the family circle. Let us then define patriotism, *true patriotism*, to consist in *love of home*. There can be no love of country where there is no love of home; and on the contrary, show me a man who loves to adorn his home with those peaceful and refined charms which God designed it should possess, and I can show you a good citizen, an honest patriot, and a true man.

Accept for yourself the esteem and respect, of your friend,

JOSEPH A. WRIGHT.

SEEDS AND BOOKS FROM FRANCE.

Agence Centrale des Exchanges Internationaux.

We received the following letter from Alexander Vattemare, Paris, dated January 10th, 1859:

B. P. JOHNSON, *Corresponding Secretary*

New York State Agricultural Society:

"Dear Sir—A most severe sickness brought on by over exertion, and which kept me for several weeks from my office, is my apology for not having acknowledged sooner the receipt of your case of books and seeds, the greater part of which are already distributed amongst our ablest farmers and practical agriculturists, who received them with the greatest satisfaction. King Philip corn was particularly interesting to our farmers. All the seeds will be tried and the results of their fructification will be communicated to you. They are all most anxious to return the courtesy, and thus to contribute their mite to the perpetuation of these blessed and benevolent relations between France and America.

His Excellency Field Marshall Vaillant was, particularly gratified with the share he had in the distribution I made in your name, and placed in my hands a choice series of vegetable seeds, cultivated by himself, and for two of which the Horticultural Society have awarded a silver medal to each. Should an experiment of these be made among you and prove successful, I need not say how gratifying it would be to the Marshall, to receive from your Society a token of their approbation for the same.

I am happy to inform you that I received from Mr. Mauny de Mornay, Director of the Agricultural Department, Honorary Member of your Society, a copy of the first nineteen numbers of "*Le Jardin Fruitier du Muséum*," each number containing four colored plates and text. This work, published under the supervision of Professor De Caine, and which will be composed of more than one hundred numbers, is considered as the most important work of this nature ever published in Europe. This may

be considered as a personal gift from Mr. Mauny de Mornay to the New York State Agricultural Society.

I obtained likewise from the minister of agriculture a copy of the "*Ampélographie Française*," folio volume, illustrated by 75 beautiful colored plates of the best grapes cultivated in the most celebrated vineyards of France. This and some other agricultural works, as well as the "*Recueil d'Hygiène et de Médecine Veteriniere*," eight 8 vo. volumes, proceeding from the war department, are presented to the State, with the respectful suggestion of having *these agricultural publications* placed in the State Agricultural Society's library, where they can be of immediate and constant service for the progress of agricultural science. In placing these works at the disposition of the State, according to the invariable rules of the system of international exchanges, which require that every object procured through its agency must always be considered as public property, yet, while preservi g its character of State property, once in the hands of the society, to be retained as long as wanted, it may be considered as their own, only in case of dissolution of said society, they return to the State. I have no doubt that the Regents will have no objection to intrust the above mentioned works to the State Agricultural Society.

I enclose a letter of acknowledgment from Mr. Payen, President of the Horticultural Society, perpetual Secretary of the Imperial and Central Agricultural Society of France, one of our greatest scientific men. No doubt this letter will be welcomed by the Society of which he is an honorary member. You will likewise find a letter of acknowledgment from his Excellency the Secretary of State, for the copy of your proceedings presented to him for the Emperor's private library.

With the best wishes for your health, and the continued prosperity of a society that is rendering such immense services to the agricultural world at large,

I remain your most affectionate and obedient servant,

ALEX. VATTEMARE.

Letter from Mr. Payen, Secretary Imperial and Central Agricultural Society, France.

SOCIÉTÉ IMPÉRIALE ET CENTRALE D'AGRICULTURE,
PARIS, *September 6th*, 1858.

Sir—I have received with lively sentiments of gratitude the generous gift which you have been so kind as to send me—the volumes for the years 1854, 1855 and 1856, works of the Agricultural Society of the State of New York. Previous to the honor of replying to you for this gift, I have desired to read the numerous documents which it embraces, and I am assured that the society has perfectly attained the design of its foundation, to improve by degrees the condition of agriculture, horticulture and all arts relative to rural constructions.

No one, more than myself is happier to applaud its progress, and I desire

to be in connection with it, and declare my sentiments of gratitude and wtih con ideration.

Be pleased yourself, Sir Secretary and learned colleague, to accept the expression of my sincere devotedness. PAYEN,

Secrètaire perpetuale de la Société Impériale et Centrale d'Agriculture de France.

SEEDS

From the Director of the Jardine des Plants, St. Pierre, Martinique.

In our last volume, p. 318, it was mentioned that a letter had been received from the superintendent of the Jardine des Plants, St. Pierre, through the American Consul, requesting specimens of the varieties of Indian corn cultivated in this State, for distribution among the landholders of the colony, to induce them to undertake the culture of Indian corn.

We forwarded a very fine collection of corn, received from farmers in our own and other States, who very promptly and generously responded to our request.

We have received a very choice collection of seeds and useful vegetables cultivated at the islands, accompanied with the following letter from Mons. C. H. Belanger, the Director of the Jardine des Plants:

MARTINIQUE, ST. PIERRE, JARDINE DES PLANTS,
January 10th, 1859.

Sir—I have learned, about thirty-six hours since, of the presence at this time in our harbor, and the departure this day to take place, of the brig St. Mary. I wish to avail myself of it to beg of you to have the kindness to present to the Agricultural Society of New York the expression of my gratitude for the honor it has done me in admitting me to the number of its corresponding members. I do not wish the ship to depart without conveying to the Society a testimony of my gratitude.

I have consequently the honor to inform you that I place on board the ship St. Mary a case containing the first collection of seeds of useful vegetables cultivated at Martinique. You will find added to this a catalogue, with some notice in regard to each species. As for a certain number, I do not know as they will have any great interest for the Society. Since these seeds will be generally in good condition, they will be rather specimens for your collection than seeds to cultivate.

I will address to you hereafter the complement to this interesting series, adding all the fruits possible to preserve the same seeds. I will also send you, by the first opportunity, a selection from all my alimentary roots.

I have added to this gift a package, inclosed in the same case, a selection of fifty kinds of seeds of plants, beautiful and easy to bloom, designed for the Horticultural Society of the State of New York.

Yours, very sincerely devoted, C. H. BELANGER,

Director of the Botanical Gardens.

To B. P. JOHNSON, *Corresponding Sec., Ag. Rooms, Albany, N. Y.*

A catalogue of useful plants cultivated at Martinique, seeds of which have been sent to the Agricultural Society of New York, by Mr. Belanger, Director of the Botanic Gardens.

I. Plants having alimentary roots.

Batatas edulis.—Vulg. The Pépé potato, one of the earliest varieties.

Canna edulis.—Its tubers furnish a very nutritious and invigorating fecula.

Dolichos tuberosus.—The tubers of this species sometimes reach a weight of ten pounds. Vulg. Toloman.

II. Plants having esculent foliaceous organs.

Areca rubra.—The terminal bud of this palm is esculent.

Basella Indica, var rubra et alba.—The leaves of both varieties of this plant furnish a more delicate spinach than the Spinacia oleracea.

Oreodoxa regia.—The terminal bud of this plant is esculent.

Tetragonia expansa.—The leaves of this plant are as valuable as those of the Basella Indica.

III. Plants producing esculent fruits.

Achras sapota.—It produces the Sapotille, that delicious fruit of tropical America.

Anona muricata.—Commonly known by the name of Custard apple. Its fruit is very much esteemed.

Anona mucosa.—The mucous cachiman. Its pulp, very mucous, is not especially agreeable.

Anona squamosa, or Cinnamon apple.—Its pulp is a true aromatic cream.

Carica papaya.—It produces the Papaw, the flesh of which has the color of the apricot, and an agreeable taste.

Malpighia glabra.—Its fruit, by its form, color, and agreeable acidity, reminds one of the cherry, by which name it is known.

Mangifera Indica.—This is decidedly the best fruit of the West Indies, where it was introduced seventy-five years ago. By propagating the best kinds (by grafting) a dozen very distinct varieties have been established, the quality of which, in respect to the abundance and flavor of the flesh, places them in the first rank of tropical fruits.

Psidium aromaticum.—Its fruit is called the Guava strawberry, because the flavor of its delicate pulp reminds one of that of the Pine strawberry.

Psidium pomiferum, or common Guava.—Its fruit is especially delicious in the form of preserves.

Spondias dulcis, or Venus apple.—The fruit of this tree is very agreeable, but does not equal the expectations raised by its name.

Spondias monbin (or, according to Loudon, Mombin).—The Monbin is a fruit of a pretty golden yellow color, and it has an exquisite perfume, but its pulp disappoints one, (literally, does not correspond with its shell.)

Vangueria edulis (Vanguieria edulis, according to Loudon), called at Martinique (I known not why) the Tamarind of the Indies, a plant to which

it is in no way related.—This tree, originally from Madagascar, recalls by its color, and the flavor of its pulp, the Medlar of Europe.

IV. Plants which produce seeds abounding in fecula.

Agati grandiflora, or Vegetable Humming Bird, thus called on account of the peculiar shape of the flower, which at a distance resembles a humming bird.—Its seeds are used in the East Indies for the food of men, but little use is made of them in the West Indies.

Artocarpus seminifer, a productive variety of the Artocarpus incisa, or Breadfruit.—This seed is known only under the name of Chataigne or Chestnut, on account of the similarity of its fecula to that of the chestnut.

Carolinea princeps, commonly called the Malabar chestnut, to distinguish it from the preceding.—There is nothing better than this chestnut, cooked with a little salt.

Cytisus Cajan, vel Cajanus bi-color, or the Angola pea.—There are several varieties of this (leguminous) plant, of which great use is made at Martinique. The seeds both fresh and dried are delicious.

Dolichos Catiang, var. Sinensis et var. Sesquipedalis.—The seeds of the first, under the name of Jerusalem pea, or marble pea; of the Sinensis, under that of the black-eyed pea, and of the Sesquipedalis under that of "pois rigois," are highly esteemed as articles of food.

Oryza sativa.—This plant is cultivated in the mountains at the height of four hundred meters above the level of the sea, without artificial watering.

Sterculia Acuminata.—It is the Koola of the natives of Senegambia, where its amylaceous seeds, of a not very agreeable taste, are much sought after. Its introduction into Martinique dates twenty years back.

V. Plants with oleaginous seed or fruits.

Aleurites ambinux.—It is the most productive nut of Bancoul, giving 56 per cent of its weight in oil. This oil is esculent when fresh, but when old, fit only to be used for illumination.

Calophyllum Calaba, vulgo Galba, gives 24 per cent of oil, fit for illumination.

Elais Guineensis (Elæis, Loudon).—It is the palm tree, which, on the coast of Africa, furnishes the palm oil, so well known in European commerce. The seeds are equally productive at Martinique.

Zatropha multifida, known under the name of coral flower, on account of the color of its flowers. Its product in oil is 30 per cent.

Moringa pterygosperma, or the Winged Ben.—This seed furnishes 22 per cent of oil, which rivals the olive oil in its useful properties. One of the uses to which it is applied is the lubrication of the works of clocks and watches.

Carapa Guianensis.—The seed of the Carapa, or rather its cotyledons, contain a yellowish oil, generally applied to illuminating purposes in South America. It is rapidly spreading in the West Indies.

VI. Plants producing seeds furnished with silky or cottony appendages.

Cotonnier de Castellamare.—This plant, which is also called the red cotton plant of Greece, is herbaceous, and perfects its product in four months.

Bombax Ceiba.—This tree furnishes under the name of silk cotton tree, seeds having a short, light, silky appendage applicable to certain uses. It has been proposed to use it in the place of eider-down.

Beaumontia grandiflora.—The seeds of this (tosesarmen) tree are furnished with a tuft nearly two inches long, forming by its lightness, elasticity and brilliancy, a vegetable plume, very unusual. It is better adapted than the preceding to supply the place of eider-down. In Europe they are now attempting to make of it artificial flowers and aigrettes for ladies' bonnets.

VII. Plants producing wood fit for cabinet work, building and useful purposes generally.

Adenananthera pavonina, vulgo Red seed Condori (?)—These seeds are produced by a tree originally from India. It is now common in Martinique, and the wood, of a tawny yellow and satin-like, is used for pretty little articles of furniture.

Andira racemosa, vulg. Cabbage tree wood, (Angelir) ?—The veins of this wood resemble those of the palm and fit it for cabinet work, for which it is used in Europe.

Cedrella odorata, (Cdrela, Loudon), vulg. Acajou femelle, the female mahogany. This monstrous tree produces a wood very much employed in the West Indies and in Europe in cabinet work.

Erythrina corallo-dendron, vulg. Immortel coral tree.—This magnificent tree, distinguished for its foliage and the beauty of its flowers, is also one of the most useful from the facility with which hedges are made of it. In a few weeks, by cutting in the stronger branches, a fence may be obtained which the rigid thorns of the plant render impenetrable.

Erythrina mitis, vulg. Immortel, without thorns.—This tree, less spreading in its growth and taller than the preceding, is used in some of the West India Islands to protect the cocoa-trees.

Hymenæa Courbaril.—This beautiful tree produces a wood for cabinet work, which is indestructible ; the greater part of the furniture in the West Indies is made of it.

Poinciana pulchevrima, vulg. Flamboyante, (Flaming.)—It is one of the most remarkable trees I know, on account of the size and beauty of its flowers. When it is loaded with them, their ruddy brilliancy seen from a distance, makes one think it is in flames. Its wood, hard, beautifully veined, and of a tawny yellow and blackish brown color, is well adapted to cabinet work.

Tectona grandis. The teck of the Indies, or teak.—It is becoming common in Martinique, and furnishes the best ship timber.

VIII. Plants whose products are used in dyeing.

Bixa orellana.—Every one knows the Rocou or Arnotto, or Annotto, and its uses.

Cæsalpinia Sappan.—Its wood is used in dyeing.

Indigofera Anil.—It is the indigofere of South America. It grows wild in the West Indies, where it might be cultivated with advantage for its products.

Hibiscus populneus, vulg. Catalpa.—Its seeds produce a coloring matter of little value. It is a beautiful tree in the forest, and is well adapted to wheel-wrights' work.

Genipa Americana.—Its fruit produces a beautiful violet dye, and its wood is much esteemed.

IX. Plants whose products are employed in medicine.

Cassia Alata, vulg. Herbe a dartres.—The leaves of this magnificent species of Cassia are supposed to be anti-herpetic.

Copaifera officinalis.—The product of this tree and its uses are well known.

Croton tiglium.—The same is true of the Croton oil, which is extracted from the seeds of this tree.

Bignonia unguiscati, vulg. Cats-claw convolvulus.—All the parts of this plant are used in curing the bite of snakes.

Melia sempervirens.—A pretty tree with lilac flowers; its bark is a febrifuge.

Quassia amara, vulg. quina pays.—Its leaves, like its bark and roots, are bitter and act as a febrifuge.

Randia aculeata.—The fruit of this plant contains a very laxative subacid pulp. It is commonly called little cassia.

Cassia Brasiliensis.—This tree bears a long pod, whose pulp, of a disagreeable odor, is purgative, like the officinal cassia.

X.—Plants whose products are applied to various economical uses.

Attaleá maripa.—This palm is one of the most beautiful of the family, and is especially remarkable for the woody spathe which envelops its flowers, and which, before the blooming, has the form of a small barrel, the purposes of which vessel it is made to answer in the domestic operations of the Indian tribes of Guiana.

Cassia fœtida.—The seeds of this cassia, torrified and reduced to a powder, infused in boiling water, furnish a stimulating liquor resembling coffee and hence called negro coffee.

Cucumis acutangulus, vulg. Torchon, also vegetable sponge, thus called because the vegetable tissue of the capsule of this gourd may be used for the purposes indicated by the name.

Thrinax parviflora, vulg. Latanier or Bourbon palm.—Hats are made of the fan-shaped leaves of this palm.

Unona odorata, vulg. Canang.—The flowers of this beautiful tree have an exquisite odor and furnish the perfume used in preparing the Macassar oil.

Sapindus saponaria.—The drupe which envelopes the seed contains a principle which produces on linen the effect of soap.

Lagus, (Raphia)—vinifera.—This magnificent palm produces sago, and alcohol is extracted from it in large quantities.

Panicum altissimum, vulg. Guinea herb.—No grass produces a better or more abundant forage.

Areca catechu.—From the nut of this pretty species of palm is extracted one of the varieties of catechu.

C. H. BELANGER,
Director of the Botanic Garden.

St. Pierre, Martinique, 10th *January*, 1859.

WHEAT CROP—FEEDING CATTLE—MANURE FOR GOOD CROPS.

John Johnston, Seneca county, writes April 6, 1858:

"*Dear Sir*—In May, 1857, I wrote you of the bad prospects of our wheat crops in this part of the State. I am happy to say, that now, our prospects this season, are as good as possibly they can be for that crop. Although very little is sown in this once very fine wheat region, still what there is looks very promising for an early and good crop (early crops have been good since I have known anything about crops). We have had a remarkable mild winter, and a very fine spring so far—thermometer 74° in the shade, at 3 P. M., for several days past. I think I never saw the like before, and the mosquetoes are as plenty in the day as I ever saw them in July or August. If such is not the case at your city you will think it incredible, *but it is a fact.* I would like to have you here to see the part I manured in the fall of 1856; summer-fallowed last year; sowed with wheat last September. It is only a small piece, and the piece beside it, unmanured, is about the same size, but it shows plainly that manure is the one thing needful, after underdraining, for making profitable farming; and I don't doubt, if the officers of the New York State Agricultural Society could only see the great need of a higher mode of feeding and manuring they would have some farm missionaries in every county in the State, to look over the counties, and advise a much higher grade of feeding and manuring. High feeding would make higher manuring, by both making a larger quantity and a quality much better. If I had all the officers of your society here, I do think I could make them strong in the faith that it pays, thoroughly to feed young cattle or sheep, so that they are worth more at two years than an immense majority of the cattle in this State are worth at four years old. I can show any man that is open to conviction, proof positive, both in my own stock and one of my neighbors. It is higher feeding, higher manuring, that is to renovate our exhausted lands of western New York. It was over cropping and no manuring that exhausted it, and a contrary course will again renovate it; but it will take time to do it—yet if every one would make a beginning it would soon be done—one would stimulate another to action. If you were to offer premiums for the

stock wintered in the best condition, the farm and stock to be viewed in April, it might do much good. I don't mean that breeding stock would be kept in condition for the butcher, but in a good thriving state, such as they are generally kept on good pastures; but all stock that is intended for the butcher's market, whether in one or two years, ought to be kept fat all the time from three weeks old until they go to market."

POTATOES—SOIL FOR PLANTING, &c.

Wm. Bacon, Richmond, Mass., writes us, April 10:

"*My Dear Sir*—Friend Bulkeley's experiment with potatoes, of pulling the vines to prevent the rot, is worthy of consideration. In many soils it will prove effective, but in cold, clammy clays, our experience with it has shown results of loss of labor. We, too, have found mowing the vines, before the disease attacks them, a good preventive; but in that case it must be done before the blight enters the field, or it is useless. When the vines are mown, new tubers are apt to start, which is objectionable.

"From our own experience we have settled down convinced, that potatoes should be planted on sward land that is dry, either sandy land or that which is dry by drainage; that no heating manures can safely be used in their culture. Of course we apply plaster, superphosphates, composts of lime and muck, leaves from the forest. We have found that early planting is not infallible—those we planted earliest a year ago rotted most. Again, we have never seen the variety that will not rot, more or less, as circumstances favor or diminish the chance of rot. The coarser and more insipid kinds are most free from it.

"Our theory of prevention can be put in a nut shell: underdrain, subsoil, apply clover muck, or something of the kind, to the land. Make it as near as it was in its original fertile state as possible, and *change in all* crops will be seen—probably a great one in the potatoe.

"The season is coming forward well. Fruit, in general, comes out fair; grass is starting with promise; winter grain looks well. If we have no untimely frosts, the prospects for the farmer are good."

DEATH OF HON. W. L. LEE, CHIEF JUSTICE OF THE SUPREME COURT OF THE HAWAIIAN KINGDOM.

We learn of the death of this distinguished American, from consumption. We have been expecting this sad news for some time, having been advised of his declining health. We became acquainted with Judge Lee about 1845, at Rome. He left there in pursuit of health, and we next heard from him by letter from the Sandwich Islands, where he had located with every prospect of renovated health. Judge Lee was the founder of the Hawaiian Agricultural Society, and was its first presiding officer—and by his active and efficient support it became successfully established, and has published several reports, and has contributed largely to the development

of the resources of the island. We purchased for him, in 1855, some choice Devon stock, which arrived safely at the islands, and will prove of great advantage to the country.

In 1856 Judge Lee was in this country on a mission from the government, and called upon us, while on a visit to his friends at Troy. Little did we then expect that his useful life was so soon to terminate. He was an able and estimable man, whose loss will be deeply felt, not only at his new home, but by many warm and ardent friends in this country, who knew his worth, and most highly appreciated him. His friends have the consolation that, though cut down in the midst of his usefulness, he leaves behind him the record of a life well spent for the good of mankind.

SANDWICH ISLANDS—AGRICULTURE.

HONOLULU, *March* 22, 1858.

From a very interesting letter from Mrs. Kate N. Lee, widow of the late Hon. Wm. L. Lee, whose labors for the advancement of the agricultural interest of the islands was so successful, we give a few extracts:

"Hawaiian agriculture, in which I know you were wont to take a generous interest, is progressing very satisfactorily, particularly in the way of wheat growing and sugar planting. While the 'Honolulu Flouring Company' is about to declare an annual dividend of twenty-five per cent, new sugar plantations are being started, and the one in which Mr. Lee was a proprietor (I remember his writing you an account of it at the commencement of the enterprise) is now pouring into the market a crop which will bring from fifty to sixty thousand dollars.

"I sent you, as an old friend of my lamented husband, a No. of the Polynesian, containing an account of his services, and one of the funeral discourses preached upon the occasion, though brief, will give some idea of his public services."

We are truly gratified at the receipt of this intelligence in relation to the valuable services of Judge Lee. He was truly one of the most active and efficient laborers for the advancement of the best interests of the islands, and the success which crowned his efforts is most grateful to his friends in this country. We remember the deep interest he manifested in the success of the Sugar Plantation, of which he wrote us a very interesting account at its commencement. Its perfect success shows the good judgment of its originator, and we trust its continued prosperity will long prove an abundant support for his family. Few men have done more in so short a time for a people, among whom his lot was cast, a perfect stranger, than Judge Lee accomplished for the Sandwich Islands. J.

DR. FITCH'S REPORT ON INSECTS.—GOLD MEDAL FROM FRANCE.

Dr. Asa Fitch, Entomologist of the Society, has received a Medal from the Imperial Society of Agriculture of France. The Medal weighs an ounce, nearly—bears on the obverse side the portrait of the *Father of*

French Agriculture, surrounded with the inscription, "OLIVIER DE SERRES, N. EN 1539, M. 2, JT. 1619;" on the reverse an agricultural wreath, around which are the words "SOCIETE IMPERIALE ET CENTRALE D'AGRICULTURE;" and on its inside, "A MR. ASA FITCH, A ALBANY, STATE OF NEW YORK, 1858."

The following letters accompanied the Medal:

[TRANSLATION.]

IMPERIAL CENTRAL SOCIETY QF AGRICULTURE,
PARIS, *April* 22, 1858.

Monsieur—I have the honor to inform you that the Society, after hearing the report of the Section of Natural History, has awarded to you a Gold Medal for the work which you have published upon Noxious Insects in Agriculture, of which work you have presented a copy to the Society.

The Medal, which was decreed to you at the Public Annual Meeting on the 18th inst., was delivered during the Sessions to M. Alexandre Vattemare, who is kind enough to take charge of forwarding it to you.

I have the honor, moreover to enclose to you at the same time, a copy of the report which was presented to the Society, and adopted by it, relative to the award which has been accorded to you on such just grounds.

Accept the assurance of my most distinguished consideration.

PAYEN, *the Perpetual Secretary.*

[TRANSLATION.]

IMPERIAL CENTRAL SOCIETY OF AGRICULTURE, PARIS—REPORT.

The Society has lately received, through Mr. Vattemare, an important work, by Mr. Asa Fitch, of the State of New York, on Insects which are injurious in Agriculture, and it has charged the Section of Natural History to make a report to the Society upon it.

The work is composed of two reports, addressed to the Agricultural Society of New York, and published by the Legislative Assembly of the State. It treats principally of the insects which attack fruit trees, and contains a large number of observations, accurately made, relative to the habits of these animals; and also very judicious applications of these facts to the treatment of plants infested by them. On account of the peculiarity of these investigations, which embrace a multitude of minute and often isolated details, it would be difficult in this report to present an analysis of the work of Mr. Fitch, but we believe it to be our duty to recommend it to the attention of Naturalists, who are engaged in the study of the relations of Entomology to Agriculture. The larger part of the facts mentioned by the author, belongs to the history of varieties which are found only in America, and consequently do not directly interest French agriculture; still, there will be found many observations from which Entomologists of every country will be able to profit, and we think that it is the duty of the Imperial Central Society of Agriculture to encourage all good works undertaken in such a useful direction.

The Section has the honor, therefore, to propose to the Society to award

to Mr. Asa Fitch a Gold Medal, with the bust of Olivier de Serres, in acknowledgment of his work.

(Signed.) A. VALENCIENNES,
GUERIN MENEVILLE,
MILNE EDWARDS, *Committee.*

The resolution proposed was adopted at the meeting of April 14, 1858.
A true copy.

Signed: For the Permanent Secretary:
The Recording Secretary, F. DE LAGARDE.

CROPS.

NICHOLS, TIOGA COUNTY, *June* 26, 1858.

Mr. R. Howell, writes:

"We are now having very hot growing weather—mercury, for ten days past, extending from 88° to 96°, in the middle of the day. The 11th and 12th were two hard rainy days, and came very warm and dry; but day before yesterday we had a hard shower, which was much needed, for it was getting seriously dry, and had begun to check vegetation. As far as I have been able to notice, the prospect of wheat and rye is very fine, also the majority of oats. Corn is doing fine now, but the majority of fields have been very much injured by worms—the brown cut and wire worms—some fields half destroyed The prospect of the hay crop is now quite good—some meadows very stout.

"The article in the June No. of the Journal, from the Transactions—the Report of the Committee on Farms—is of great interest; also the article on Insects. It shows how highly an Entomological Survey is appreciated in foreign countries, and speaks volumes for it."

EDWARDS, MISSISSIPPI, *July* 13, 1858.

M. W. Phillips, writes:

"We have as unfavorable a season as I have ever known; rain daily—even too much I think for heavy corn. Not too late for upland cotton yet to make a full crop.

"The overflow has done untold evil; never before has this country been so injured. In some places the water has been as high as ever known; in others not so high as in 1828; in others not as high as in 1850; but owing to much more land being in cultivation, the loss has been immensely greater. I have, since the middle of May, been up and down the river, as far as Cincinnati, and know what I say; no paper has begun to give anything like the destruction that is in reality. It is heart-sickening to see so many people, poor and rich, with not a foot of land—crop and stock gone—it is awful; the uplands suffering from the excessive heavy rains.

"My own crop is clean, and I have much hope that I will make a fair crop. I have not the greedy hope that I will equal last year in cotton—say full twelve to twelve and a half bales per hand, but I will excel in corn and meat. I think my prospect is good for over 200 bushels of corn, and 600 pounds of pork, per hand, which will enable me to sell of both, 150

bushels of corn, and 300 to 350 pounds of pork will do me. The people are taking much interest in agriculture, and I hope, ere many months, that we will be on the way."

West Northfield, Illinois, *July* 20.

Dr. J. A. Kennicott, writes:

"Barley is the only grain harvested in this vicinity, and is a fair crop. *Spring wheat* looks pretty well, though not all safe yet. *Oats miserably rusted*—never anything like it here. *Corn* looks better than expected; some early planted equal to any I ever saw at this season. Early planted potatoes miserable. All our land, except the *underdrained*, is hard, baked and impracticable. We have had but a shower or two at this point since my last letter; but west and north they have had immense floods, which have caused some damage.

"Apples and pears less promising than a month ago. From June 18th to July 8th, the hottest days I have ever witnessed this side of Mississippi and Louisiana, and *more sickness* than I have known in twenty-three years."

MEDITERRANEAN WHEAT AND WHITE WORM IN WHEAT.

Near Geneva, 30*th July*, 1858.

John Johnston, writes:

"Col. B. P. Johnson:

"*Dear sir*—Our wheat and barley harvest is about finished. Our white wheat is a very poor crop; the Mediterranean is better I think than it has been for some years past, and think this is the case in this county, and also in Cayuga and Ontario counties. The wheat is of fine quality, and I have no doubt but the yield of the Mediterranean is an average crop for this and the other counties mentioned, for twenty years past; but there was very little wheat sown in the counties mentioned, and that is the true way to bring up the land to its former productiveness—plow less and manure better. I did expect that by high feeding and high manuring that I could continue to raise from fifty to sixty-five acres of white wheat yearly, but this season makes me doubt it. I will sow sixty acres this fall, but think of sowing thirty-two acres of it with Mediterranean, (I wish it had a shorter name;) but I am not yet decided, until I thrash my fourteen acres of salted wheat. If that turns out well, I will sow more white wheat, and of salt liberally. "That *white worm*,"* that took quite a quantity of the wheat in the end of April and May, has been on some farms in Cayuga county for twenty years, and always on the same parts of the field, but increasing a little every year that it was in wheat; but they never knew the cause until this year. They heard there was a white worm, and they went to work and found it—so I have been told by a very respectable farmer who lived a long while in that county. I had a farmer from Ohio here lately, who told me they have had the same worm in Ohio for ten years or more. My Cay-

* The White Worm spoken of we hope will be secured at its next appearance, so that Dr. Fitch can examine it, and decide as to its character. We hope farmers, when it appears upon their grounds, will secure some and enclose them to the Secretary, at the Agricultural Rooms.

uga friend told me they seldom hurt wheat sown as late as the 20th of September; that I was aware of myself; but he said they never touched Mediterranean, which seems somewhat strange. I am going to sow twenty-eight acres with Soule's wheat this fall; in that field I had a number of spots taken by the worm, in both 1853 and 1855, probably amounting in all to two or three acres; it is now far too rich for red wheat. I will salt heavily on those places—I know about where they are, and will not sow till after the 15th of September. My barley and oats are excellent, and corn in general looks very promising. Hay was a large crop with us, and got in in good order. Yours, truly, JOHN JOHNSTON.

WHEAT INSECT.

L. L. French, Warren, Herkimer county, July 30, 1858, writes:

"Col. B. P. Johnson:

"*Dear Sir*—I think our spring wheat is very near spoiled by the worm, if mine is a sample of the rest. I sowed my first the 17th of April, and by examining, I find from one to ten worms in a kernel; and the next piece I sowed the 28th of April, and that is still worse. By looking I find them lying side by side, from one to twelve in a kernel. I have still another small piece, sowed, I think, the 3d of June; how that will be I cannot as yet tell, as it has not headed. Other crops look well. We have now had a fine soaking rain, which will help the later crops. Farmers have had a fine time for getting hay, for two or three weeks, and a good share of the crops secured in fine order. The mowing machines have done a good share of the mowing in this town this season, and another season they will be used still more, and farmers will get their haying done so quick and cheap that they will have more time to improve their farms by ditching and other improvements. I am satisfied that our farms may be *very much* improved by *ditching*. I have done something at it, and intend to do more, as I have time and means. I find that our small stones, that we pick off our meadows, may be used to advantage in our blind drains, and when I have some leisure I will give you my method of putting them in; also the expense of the drains. I have not seen any rotten potatoes yet, but I see the leaves begin to quirl. I think if they don't rot, this crop will be very good."

RUST IN WHEAT.

William Hutton, Esq., Secretary of Bureau of Agriculture and Statistics, Canada West, writes, July 30, 1858:

"It is much to be feared that our crop of wheat in Canada, the present year, will be a very short one, chiefly owing to rust, which appears to me to be often occasioned by want of proper *drainage*, and of early sowing and well shaped ridges, which assist the drainage very materially. I have an idea

that the influences of close, hot, damp, muggy weather are *less sudden* on well drained and well cultivated land; and these *sudden* influences are what caused the rust by the sap *bursting* the straw, and the juices flowing downward instead of rising to nourish the ear. This is the opinion I have formed from long experience, and I am also of the opinion that the rust is not the fungi caused by insects, which many authorities affirm."

Mr. H. says: "I have received only one reply to a circular as to the state of the crops, and that from a large practical farmer; he says he will only have ten bushels to the acre, instead of forty bushels as he expected, entirely owing to *rust*, not midge.

CONCENTRATED MILK.

G. Borden, jr's, patent process for concentrating and preserving milk, has recently been put in successful operation in Burrville, Litchfield county, Conn., and milk reduced to about two-ninths its original volume, is now sold in New York at about thirty-two cents per quart. It is recommended to all who are sensative on the subject of swill-fed milk in cities. Its taste is that of ordinary scalded milk, and the process of preparation consists in keeping it from the air, and concentrating it as rapidly as possible by boiling *in vacuo*, at a temperature of less than 130° Fah. In using it, water is simply poured in until the fluid is restored to its former condition. From personal experience we can recommend it as a better article for family use than most of the milk sold in this country, and equal to the best. Under ordinary circumstances this milk will keep a little longer than common milk, but there are two ways in which it can be preserved for months, and probably for years. It may be hermetically sealed in cans, or may be combined in due proportion with pulverized sugar—the sugar being less than required by ordinary tastes as sweetening for tea or coffee. A third method, that of surrounding it with ice, will preserve it for several weeks. There is a prejudice against *manufactured* milk, but this article is simply pure country milk, reduced in bulk by the loss of 75 or 80 per cent of its water. We can vouch for the integrity of Mr. Borden, having known him for many years.—*Scientific American.*

We have used this concentrated milk, and it is decidedly a better article than that usually sold in the city for family use. We are well acquainted with Mr. Borden. He is a man of strict integrity, and we do not hesitate to assure those who may patronize his effort, that they will not be deceived.

J.

FINE WOOL SHEEP.—By Carl Heyne..

Mr. Chamberlain's Sheep, New York.—The fine wool sheep of Mr. Chamberlain were from sheep raised by Mr. Ferdinand Fischer, who brought a flock of 100 ewes and four bucks, in the year 1811, from Spain, and paid

for them a very high price. The race is "Infantando" and "Negrette," and since they have been in his possession have been crossed in their respective families, and never mixed with other breeds.

All his sheep are numbered and marked by a cut in the ear, and every year each one is examined separately, and as the wool of the ewes and bucks harmonize together, so they are matched. Mr. Fischer gave this flock of sheep to his son Louis, and he bestowed the same care as his father, in regard to food and pasture.

When there is rain or soft weather, the sheep are never turned on to the grass plots, but are kept in stables, as rain or moisture is very injurious to the health of the sheep. They are not allowed to be too long on the pasture; have plenty of water three times a day, and in the evening hay and straw.

In winter, or from the 1st of November till May 15th, they are kept in good stables where they are fed as follows: in the morning at seven o'clock they get good hay, at eleven o'clock beets mixed with straw, cut, and hay, at four o'clock again hay and straw, and fresh water at each time of feeding, and are furnished every day with fresh straw for bedding.

The lambs are separated from the ewes from 9 A. M. till 1 P. M., and from 2 P. M. till 7 o'clock in the evening, and when separate they are fed with oats and very good hay, and have a little water.

Mr. Fischer's flock is renowned both at home and abroad; he calls them the pure original stock of clear Infantando and Negrette sheep. They are sold to Russia, Poland, Saxony, Hungary, Wurtemburg, Silesia, Pomaria, and a large number in the neighborhood of Berlin and Breslaw, and even to Turkey and Australia. The average price for a buck is 560 thalers (nearly $400). These sheep give satisfaction every where, and are esteemed for their fine wool and large fleeces, which gives a much finer cloth than the best Saxony wool.

Farmers in America should bestow more care upon their sheep than is generally given. All the care and labor bestowed upon their sheep would be amply rewarded. They should be provided with good stables or shelter in the winter; good hay, which should, for this purpose, be cut earlier in the season than that which is generally used for sheep; this late hay is not much better than straw; a good shepherd, or man to take care of them, who understands the nature and habits of the sheep, and what is suited to them. They are very delicate, and cannot stand the rough treatment often given to cattle. There are three different races of Merino sheep, viz: the Infantando, the Negrette and the Esquerial. In America the different races of fine wool sheep are not very generally known, but all are classed as Merinoes.

In my next letter I will give a description of the diseases of sheep.

CARL HEYNE.

Red Hook, *August*, 1858.

CARL HEYNE ON DISEASES OF SHEEP.

How I recognize the "Carbunckle Disease," in sheep, and my mode of treating it.

This disease first manifests itself by the following symptoms: The animal separates itself from the flock, or follows behind when they are driven, with drooping head; it hears no call, not even the barking of dogs; it breathes very quickly; the eyes are prominent and staring, with dilated pupils; the ears, like the head, tail and extremities, are cold, but the mouth is hot and dry; the mucus membrane of the nose is more or less bluish; the snout is dry; the animal seldom eats, and only occasionally nips the tips of the grass.

As soon as the symptoms of this disease are perceived, first, bleed the animal copiously, and then give the following powder, in a little water: Saltpeter (niter) in crystals, one drachm; calomel, ten grains; camphor, ten grains—these pulverized and mixed together; then stick a plug of soap in the anus. Should this be removed, by the animal dunging, it must be replaced, or what is better, a clyster (injection) administered, of salt in soap and water, or of a decoction of tobacco.

The animal must be allowed to remain quiet, in a cool stable, or in the pasture in a shady place; and if in one-half or three-fourths of an hour the symptoms are not better, then administer more of the powder to the animal, of one-half or three-fourths of the original dose; according to the symptoms.

If there appears inflamed spots on the back, head, tail, feet, or other parts of the animal, then the disease is most dangerous. These spots may be recognized by the skin assuming a bluish color, and looking like parchment. As soon as these spots are observed, the skin in each should be cut through, by two incisions in the form of a cross, and tobacco ashes, pulverised charcoal or spirits of turpentine applied. Only in this way can the animal be saved—if it be bled when these spots first appear, that sometimes helps. The treatment must be prompt—by delay all is lost.

P. S. Cold weather is now commencing, and the soil is soft and wet. It is well to put up sheep in a dry yard or stable, by night, and have them well littered with good dry straw. It is also well to let them have some dry fodder, as straw, cornstalks or hay. The feed is now good and growing well. They may be pastured on growing rye, in dry weather, but not in wet—it does not injure rye to pasture (or mow?) it in the fall.

CARL HEYNE.

Red-Hook, *October 25th*, 1858

THE FOOT ROT IN SHEEP.

How I recognize it, and my method of treatment.

The foot rot is essentially an inflammation of the softer parts of the foot, about the horny covering, or the hoof, which is contagious, so if it once appears and is not checked, the whole flock generally is injured. The disease may be known by the following symptoms: The animal limps

walking as if the feet were painful, the hoofs are hot and the skin adjoining swells, with symptoms of fever, ordinarily being alternately hot and cold. The ears and legs both are hot and cold by spells. The inflammation is partly in the cleft of the foot, partly in the toes under the hoof, and partly under the edge and thin part of the hoof. The appetite fails as soon as the fever appears. If the fever abates and the appetite returns, it will go well with the sheep, unless the decay of the bone (*caries*) sets in, which symptom attends the most malignant form of the foot rot. On the second or third day following the appearance of the disease, the hoof and adjoining parts lose their reddish color and become at first whitish and then pearly color, the skin in the cleft of the foot in the meanwhile being redder, more like the natural color, then follows a watery discharge of exceedingly offensive odor, the skin separates from the parts beneath, and the foot becoming more painful, the lameness increases. The inflammation continues to increase, and extends farther under the hoof and deeper into the flesh, and affects more extensively both parts of the foot, or both sides; the cleft becomes gradually deeper by the dividing of the flesh, the tender flesh that unites the hoof to the bones of the toes softens, and results in the hoof falling off entirely in the course of about three to four weeks.

As soon as the true malignant foot rot is discovered in the flock, the diseased sheep must be separated from the healthy ones, and the stables must be cleaned.

The best remedy for this disease that I have found is butter of antimony (*butyrum antimonii or chloride of antimony*) and spirits of hartshorn. The spirits of turpentine and blue vitriol mixed together are also very good. The animal must be turned up on its rump, that the feet can be thoroughly examined and all the dead parts cut away with a sharp knife down to the living part; if it bleeds a little that does no harm. The foot must then be smeared with the mixture of spirits of turpentine and blue vitriol. It is sometimes well to bind up the foot in a linen bandage. The animal must not be allowed to go in any soft or dirty place, but should be kept on dry straw litter. Every fourth day they must be carefully examined one by one, and the remedy again applied as long as is necessary. If this is strictly adhered to, in the course of a month the flock will be entirely sound again. The appetite will return and the animal in a short time be again in good condition.

CARL HEYNE.

Red-Hook, *February* 3*d*, 1859.

TRANSACTIONS PUBLIC LIBRARY GUILDHALL, LONDON.

We have received the following letter, acknowledging the reception of the Transactions of our Society, presented to the Library of the city of London:

Guildhall, London, *October* 1*st*, 1858.

B. P. Johnson, Esq., *Albany, N. Y.:*

Sir—I am desired, by the Library Committee of the Corporation of London, to acknowledge the receipt of a case containing twenty volumes,

being the Transactions and other Agricultural Works of the New York State Agricultural Society.

The committee desire me to present, on their behalf, their thanks for this handsome and valuable contribution to their library; and they further beg me to express the pleasure they have in accepting such a donation from yourself, as the representative of a country associated with us by so many sacred, and, it is to be hoped, enduring bonds.

I have the honor to be, &c., yours, respectfully,

CHARLES REED, F. S. A., *Chairman.*

McCORMICK'S GRAIN REAPER, WITH BURGESS AND KEY'S ATTACHMENT.

The Committee of the State Agricultural Society appointed to examine Mr. C. F. Mann's Steam Engine and Apparatus for Plowing, met at the farm of Theodorus Dusenbury, near Troy, on the 26th July, and after examining the machine and witnessing its operation, were requested by P. T. Heartt, Esq., late American Consul at Glasgow, to witness the operation of McCormick's Reaper, with Burgess & Key's Attachment.

The machine was put in operation upon a field of wheat, and did its work entirely satisfactory. The improvement consists of a series of rollers on the platform, fitted with archimedian screws, by which the grain, as it falls on the platform, is delivered in a continuous and well formed swath, at the side of the machine, thus dispensing with the labor of one man in working the machine, and leaving the grain to be bound up by the raker at his leisure. This arrangement enables the farmer to cut his grain much earlier than when delivered in gavels, or behind the machine—in the latter case requiring the grain to be immediately bound, so as to allow the machine to proceed. A great advantage is secured by this improvement, which has long been desired by our farmers. Grain requires, frequently, to be left in the swath for a time, so as to be cured, and in condition to be safely bound—and the approbation expressed by the great number of farmers present, showed the importance of this improvement. The excellent farmer on whose farm the trial was had, informed the committee that this was all he desired to be added to his Ball's Reaper to meet all the requirements of the reaper.

We consider this a very valuable and desirable improvement, which can be applied at little expense to the reapers in use in this country, and Mr. Heartt is deserving of great credit for presenting it to the farmers of our State and country, and we congratulate him on the favorable result of this trial, before so large a number of excellent farmers.

GEORGE VAIL,
L. CHANDLER BALL,
WM. KELLY,
CHAS. VAN BENTHUYSEN,
HORACE L. EMERY,
LUTHER H. TUCKER,
B. P. JOHNSON.

It may be proper to remark, in behalf of the managers of the Rensselaer County Agricultural Society, that so far as they were present to witness the trial of the reaper presented by Mr. Heartt, they fully concurred in the opinion expressed in the committee's report above presented.

GEORGE VAIL.

MILK FROM SPAYED COWS—INTERESTING TO DAIRYMEN.

It is known to all our dairymen, that the milk of cows varies greatly. In a period when the cows are in heat, the milk is very unhealthy and injurious to other milk in contact with it. The milk of cows, for a time after calving, is also not as good as at a subsequent period. A French gentleman, "Delamarre," proprietor of a milk establishment in Paris, gives the following account of

The Milk of Spayed Cows.

"This milk is produced from cows which, after the fifth or sixth gestation, and five or six weeks after calving, undergo an operation which consists in the removal of the ovaries, thus rendering the cows, henceforth, incapable of reproduction.* From this time, as happens to the ox, the animal changes in its nature and its milk, which we have named milk of spayed cows, is free from all perturbations. The spayed cow does not undergo those disturbances arising from being in heat, from gestation, and perturbation, she is free from those causes which produce such evil effects in the quality of the milk.

"In this new condition her milk becomes regulated, and, which is important to the farmer, lactation is maintained in full quantity, for a year at least, and is prolonged, diminishing in quantity but increasing in quality, two and even three years, when she is not too old, and is properly kept. When lactation has ceased, the cow, which has by a quiet and reposed life become considerably increased in flesh, may be delivered to the butcher in perfect condition, and the meat is superior to that of ordinary cows. By generalizing the spaying of cows, after the fifth or sixth gestation, there would be introduced into common use milk of an irreproachable quality.

"The milk of spayed cows gives more cream than ordinary milk; it is also richer in casein, which constitutes—a fact generally unknown—the most nourishing part of milk—hence the superior quality of the milk. The butter extracted directly from the milk is delicious in taste; it testifies to the amount and richness of the casein it contains. This milk offers

"The spaying of cows was known in remote antiquity. In modern times the practice dates back about twenty-five years, with the design to increase the quality of milk in cows. In 1830, Mr. Winn, Natches, Miss., applied it with advantage in the production of milk. Mr. Winn proceeded by the cesarian operation, which is still pursued in U. S., but it presents serious difficulties, resulting occasionally in the death of the animal. In France, M. Charlier, Veterinary Surgeon, executes the operation without external incision, and renders the chances of mortality much less.

precious resources for the artificial raising of infants; it might be asserted that they will be better nourished; for the nourishment of infants, who give it the preference over other milk, we do not doubt that the milk of spayed cows will be principally used.

"Such is the milk introduced by M. Delamarre at his establishment for consumption."

APPLE-PIE MELON.

We received, early in '58, from J. Q. A. Warren, Esq., one of the editors of the *California Farmer*, seeds of this choice melon, described in the annexed article. We placed it in good hands, and we have received some of the product.

"SPLENDID MELONS.—The famous *Apple-pie melons*, as they are called, and which have excited considerable interest among the lovers of good apple pies, from the fact that this melon makes good *apple pies*, will prove a great blessing to all good housewives, for they can now have *apple pies* all the year round, and not be obliged to pay a dollar, or even *two bits*, a piece, for they can make their apple pies without apples. We only assert what is easily proved—this variety of melon will make pies that nine persons out of ten will pronounce apple pies. Two years since we had two of these melons presented us by James Lick, Esq., of Santa Clara. The pies we ate from these melons at various times satisfied us of the facts stated. One of the melons we now have in perfect order, weighing forty-five pounds. Thus we have a valuable proof of their keeping qualities. The present week, when at Santa Clara, we were again presented with two melons of the same species of greater weight, each over fifty pounds. These can be seen at our office also."

This melon is found to grow as readily as the cucumber, and is really a valuable addition to our vegetables, and will keep all winter, if free from frost, and is ready for use any time.

The annexed method of preparing it is from the *Southern Homestead:*

In preparing this melon for pies, it should be peeled and cut into small pieces, of course first removing the seeds. These should then be boiled for about three hours, or until it looks like stewed apples. Add a small quantity of sugar, although this is not essential, as it is sweet enough to many tastes; flavor with a little lemon juice and make into pies. The most acute epicure will relish this "genuine" apple pie; it has none of the squashy taste. By the addition of milk and eggs, omitting the lemon, you have a fine custard.

James O. Sheldon, Esq., of Geneva, who had some of the seed last year, has furnished us with some of the melon dried. It has been prepared agreeable to the above direction, except the sugar, and is esteemed one of the most valued vegetables we have had—the flavor equal to the very best apples.

J.

THE LATE BARON ALEXANDER VON HUMBOLDT.

We received the annexed letter from his Excellency Joseph A. Wright, American minister at Berlin, as the present volume of the Transactions was being printed. The letter enclosed from the late Baron Von Humboldt, acknowledging the receipt of the Transactions of the society, was probably one of the last, if not the last, written by him. It will be perused with great interest by every American. Humboldt took much interest in our country, and his letter shows how much he was gratified at receiving the proceedings of our society. The original letter will be preserved in our rooms, for all time, and will ever be read with the deepest interest. This letter was written on the 15th of April, and he died on the 6th of May.

We are under very great obligations to Mr. Wright for presenting us this memorial of his distinguished friend, and the friend of humanity in its broadest, fullest sense, and a firm believer in the advancement of liberty, virtue and knowledge among the nations of the earth. B. P. J.

BERLIN, *May 11th*, 1859.

My Dear Sir—Your very interesting volume of the Transactions of your board for the year 1857, were most welcome.

A copy was forwarded through the ministers residing here to the celebrated school at Hohenheim, also to the Saxon and Hanoverian institutions.

I have placed a copy in the hands of the Prince of Baden, a gentleman who manifests a lively regard in all that relates to the agriculture of our country.

The Prince Frederick Wilhelm has received several copies of your reports, including this late one, and knowing the interest he takes in the development of the resources of his own country and the advancement of the cause of labor, I shall be most happy to learn that each subsequent number of your valuable reports are forwarded to his royal highness.

I have in my possession copies of the reports of the institution of Hohenheim. These and others that I may receive, it is my purpose to forward to your board in the ensuing autumn, together with such seeds and other articles from this country, as you may designate as most likely to be of value to you.

My first duty was to forward a copy to the lamented and beloved Humboldt. You have his reply. I cannot do less than send you this which is one of the last letters he ever penned. Knowing how highly your association and people will prize it. What a privilege to have secured from his own hands, the promised letter to your worthy national society; but it was otherwise ordered. On Friday last, in the full possession of his great mental faculties he fell asleep, and yesterday we followed him to his last resting-place. Though a son of Prussia he belonged to no country, and his age is not counted by years. A little more than two months ago he participated with us in celebrating the natal day of our country's father, and when the name of Washington was proposed, he rose from his seat, and standing under the folds of the flag of liberty, said "I am half an Ameri-

can." The world at large will remember his death as the leader of science. But we must cherish his memory because he was also the friend of humanity in its broadest, fullest sense, and a firm believer in the advancement of liberty, virtue and knowledge among the nations of the earth. Accept assurances of yours truly,

JOSEPH A. WRIGHT.

B. P. JOHNSON, Albany, N. Y.

LETTER FROM BARON ALEXANDER VON HUMBOLDT.

Monsieur le Ministre:—As a little more leisure is required to enjoy the richness which the fine volume of 800 pages of the Transactions of the Agricultural Society (vol. xvii, 1857,) offers, than these times so politically agitated, can offer me, I must prefer to present, later, to the society itself, the homage of my respectful gratitude, and to beg your Excellency to have the kindness, in the mean time, to forward, in my name, the expression of the great satisfaction I have felt in receiving such a precious present from the hands of so kind and illustrious a friend as Mr. Wright, Envoy Extraordinary and Minister Plenipotentiary of the United States of America. I have received, during all the time in which we have the pleasure to have you among us, so many marks of affectionate kindness from your Excellency that I make confidently this request, hoping to be able, in a few weeks, to bring you myself a letter directed to this worthy national society.

I am, respectfully, dear minister,

Your most obedient and devoted servant,

A. V. HUMBOLDT.

BERLIN, *April* 15, 1859.

REPORT OF THE TRUSTEES OF THE STATE AGRICULTURAL COLLEGE.

STATE OF NEW YORK:
EXECUTIVE DEPARTMENT,
ALBANY, *March* 3, 1859.

To the Assembly:

I transmit herewith the second annual report to the Legislature of the Trustees of the State Agricultural College. It shows that the erection of a large and substantial college edifice has been contracted for; that the foundations have been laid, and that the work of erection is to be vigorously prosecuted as soon as the season will permit. It is hoped that the building may be completed during the present year; but as the trustees are determined not to open it for the reception of students until everything is in order, it is possible that no students will be received until the spring of 1860. The trustees indicate, in general terms, the principles which will govern them in the management of the institution. Under their guidance I feel confident that it has before it a long career of usefulness, not only to its immediate beneficiaries, but to the people at large.

E. D. MORGAN.

NEW YORK STATE AGRICULTURAL COLLEGE.
OVID, SENECA COUNTY.

To the Honorable Legislature of the State of New York:

The first annual report of the college was made to the Legislature by Samuel Cheever, then president of the college, March 8th, 1858 (Assembly Document, No. 154). Since the date of that report Mr. Cheever has resigned, and a successor has not yet been appointed. This report is made on behalf of the trustees, and briefly alludes to the operations upon the farm, and such other matters as are deemed necessary to be mentioned as regards the progress which is making in the erection of the buildings for the accommodation of the students. It was stated in the former report, "That it was contemplated, under the direction of the building committee of the trustees, to construct, the coming season, so much of the college edifice as will be sufficient to commence a course of instruction upon the plan which has already been decided upon. It is intended to build the outer walls of the edifice with stone. The committee intend to commence

the work at the opening of the spring, and hope to carry up the walls and roof them in before the coming winter, and then finish as early as may be."

The trustees, in view of the expense of building with stone, as compared with brick, except as to the first story, decided in favor of brick, and issued proposals for the erection of the south transverse wing 58x128 feet, and the lateral wing 60x84½ feet, four stories high, first story to be of stone; the three others and the inside walls to be of good brick, with stone window caps and sills, and slate roof.

The contract for these erections was entered into in September with Thomas Crawford, whose proposals being most favorable, had been accepted. Mr. Crawford is a mechanic of experience, highly recommended for his ability and integrity as a workman.

The contract embraces all the necessary preparations for heating, ventilation, light and water throughout the building. The contract price for doing the entire work amounts to from $32,500 to $33,500. The building, when completed, will accommodate one hundred and fifty students, with the necessary conveniencies for the steward of the college, and rooms for the professors and lecturers. The excavations for the foundation have been completed, and the foundation walls, from four to six feet high, founded upon the rock, have been laid and secured againsts the winter frosts; and the workmen are engaged in preparing the materials, and will resume their work early in the season upon the walls of the building, and the work will be prosecuted as rapidly as may be consistent with the proper solidity and safety of the structure.

Accounts of payments since April 18, 1858.

There have been paid on accounts and materials due up to March, 1858,	$1,701 34
For lumber purchased for building,	3,310 91
permanent improvement of farm,	469 71
furniture of house on farm,	137 30
miscellaneous expenses,	98 29
purchase of stock for farm,	597 97
interest on amount due on farm,	1,117 31
Expenses carrying on farm (this includes $441.73, not for the ordinary expenses of carrying on the farm, but for permanent improvement, and other work),	1,291 69
	$8,724 52

Farm.

The avails of the farm, as ascertained from the foreman upon the farm, including articles sold, and those remaining on hand, are as follows:

200	tons	of good hay,	$5 00	$1,000 00
100	bush.	winter wheat,	1 00	100 00
200	do	spring wheat,	1 00	200 00
125	do	buckwheat,	50	62 50
1,000	do	oats,	45	405 00
900	do	potatoes,	37½	337 50
700	do	corn,	62½	437 50

40 do clover seed,	$4 00	$160 00
10 do timothy seed,	3 00	30 00
2,200 lbs. pork, of 11 swine,	05½	121 00
200 lbs. butter,	20	40 00
		$2,893 50

Fat stock.

15 three year old steers; 6 two year old steers; estimated to be worth, when ready for market, $55 per head,	1,155 00
	$4,048 50

A. Joy, Treasurer.—Report from April 1 to Dec. 31, 1858.

Apr. 10.	Received from Comptroller,	$10,000 00
Dec. 2.	do do	5,000 00
	Collections on subscription notes,	1,269 43
	Received from sales from college farm,	748 27
	do from sales of engineer's level,	75 00
	do from President Cheever on settlement,	153 76
		$17,246 46

Disbursements.

	Paid am't of acc'ts due up to Mar., '58,	$1,701 34	
	do int. on debt on college farm,	1,117 31	
	do F. S. Martin in full for lumber,	3,310 91	
	do Thos. Crawford, contractor,	1,000 00	
	do S. E. Hewes, architect,	153 50	
	do drawing lumber to college site,	128 58	
	do furniture for dwelling,	137 30	
	do permanent improvements,	469 71	
	do miscellaneous expenses,	98 29	
	do purchase of stock for farm,	597 97	
	do expense of carrying on farm,	1,291 69	
Dec. 31.	Cash in hand of treasurer,	139 86	
	do in Oneida bank to credit of treasurer,	7,100 00	
			$17,246 46
	Balance to credit,	$7,239 86	
	Since the first of January there has been re-received from the Comptroller, Feb. 11th,	5,000 00	
		$12,239 86	
	Balance from State on loan unpaid,	9,670 00	
			21,909 86

Stock upon the farm.

3 milch cows, 8 years old.
1 milch cow, 3 do
1 do heifer, 2 do
1 fat cow.
9 two years old heifers.
7 one year do
5 do old steers.

1 one year old short horn bull.
4 spring calves.
24 sheep.
12 store hogs.
15 three year old steers, and 6 two years old, fattening for market.
2 yoke of working oxen.
1 span large extra horses.
1 span good common work horses.

It is not deemed important to give an inventory of the implements and working tools. There is a good supply of implements, many of which have been very liberally presented to the college, and a list of articles presented during the year is annexed :

Donations acknowledged.

Emery Brothers, Albany ; one of their superior two-horse power thrashers, separator, &c., complete.

I. T. Grant & Co., Junction, Rensselaer county ; one of their premium fanning mills.

Richard H. Pease, Albany ; Krouse's patent cider mill.

Lyman J. Lloyd, Albany ; one set extra two-horse draft harness.

Walter Warren, Penn Yan, Yates county; patent iron beam plow.

Messrs. Rathbone & Co., Albany ; " The Albanian " prize parlor stove.

Hon. Wm. Kelly, Rhinebeck ; Short Horn bull calf " Justice."

Hon. Henry Wager, Western, Oneida county ; one fine South Down buck.

Hon. Henry Wager, set silver-plated furniture, complete for use of house.

Solon D. Hungerford, Adams, Jefferson county ; one Yorkshire boar, and one sow same breed.

James C. Bodine, Ovid ; two fine pigs, good breed. Several other donations, which the donors preferred not to have named.

The trustees would respectfully report, in conclusion, that their confidence in the success of the institution entrusted to their charge, has not in the least been lessened by another year's experience. They feel, however, that a great responsibility rests upon them. The subject of an institution for the instruction of the sons of farmers and mechanics, and others, in the great work before them, is as yet in a great measure untried in this country ; though, as far as the institutions now in progress report, there is every reason for encouragement. Upon the manner in which this institution, as well as others to be put in operation, shall be conducted, much depends. That an institution may be so conducted, as to be the means of doing great good, and of securing the co-operation and cordial support of the farmers and mechanics of our State, we have great confidence. We shall have to meet the ardent expectation of many who will expect that a single year's operation will show great practical results ; and others will expect, it may be, that experiments of the most important character will be exemplified at once, on the institution being put in operation. To such we would say, the work connected with an agricultural institution must, of necessity, require time to develop all that can be done for the proper instruction of the students, and for the satisfactory developments of facts, which are to be ascertained from long continued and well conducted investigations and experi-

ments; and while we feel assured that a single year of instruction will be most valuable to every industrious and thorough pupil, yet we cannot disguise the fact, that a series of years must be required to fully develop the inestimable value of an institution like this.

The trustees intend that the course of studies shall be thorough and practical, so that every student shall be enabled properly to understand the great principles connected with agriculture in its every department, and how practically to apply them in the management of the farm. It shall be their aim to select, as instructors, those who are competent to give such instruction, so that no portion of the work necessary to be understood shall be overlooked; and all who pursue a thorough course of study shall be able to carry out all the principles and practices deemed necessary and important for the farmer.

It is hoped that the erections now in progress will be completed during the coming season; but, as yet, it cannot be decided whether the institution will, in all respects, be so prepared as to receive students previous to the spring of 1860. The trustees prefer to have the buildings and arrangements complete before the school is opened for students, so that the full benefit of instruction may, from its commencement, be realized.

To the donors who have so liberally contributed to the institution, we are under great obligations, and we hope that others will, in like manner, contribute to the stock and implement department of the farm, with an assurance that the same shall be properly disposed of, and such trials and investigations made as shall prove useful to the donors and to the public.

To the farmers of the State we look with confidence for the support of the institution, and we trust they will see the importance of sustaining the institution by their contributions to its funds, as well as by sending to its halls their sons, to be educated in a manner which shall not only increase their usefulness, but place them in a position equal to the educated men of other pursuits.

Respectfully submitted on behalf of the trustees of the New York State Agricultural College. B. P. JOHNSON, *Secretary.*

March 1st, 1859.

Trustees of the College.

Hon. John A. King, Queens, Chairman; Hon. William Kelly, Rhinebeck; Hon. Henry Wager, Western; Hon. Abraham A. Post, Flint Creek; Hon. Addison Gardner, Rochester; Joel W. Bacon, Esq., Waterloo; Maj. M. R. Patrick, Sackett's Harbor; Alexander Thompson, M. D., Aurora; James O. Sheldon, Esq., Geneva; B. P. Johnson, Albany; Hon. Wm. Buell, Rochester; Hon. Samuel Cheever, Waterford; Hon. J. B. Williams, Ithica; E. P. Prentice, Esq., Albany; Rufus K. Delafield, Esq., New York; Arad Joy, Esq., Ovid; Hon. Benjamin N. Huntington, Rome.

Officers of the Board.

President— —— ——
Chairman Trustees—Hon. JOHN A. KING, Queens.
Secretary—B. P. JOHNSON, Albany.
Treasurer—ARAD JOY, Ovid.
Counsellor of the Board—Hon. JOHN E. SEELEY, Ovid

COUNTY ASSOCIATIONS.

Most of the county agricultural societies have presented the report of their proceedings the past year, and in many cases, the reports are valuable and contain important and interesting experiments in agriculture. There is, evidently, far more attention being given to the substantial and permanent improvement of the farm, in all its departments. Attention is being directed to draining and thorough culture of the soil. The use of manures both ordinary and special is more carefully attended to, and the results are being manifested in the better crops and the improved condition of things in all respects.

The improvement of our stock is shown at all of our fairs, and can be seen in every town in the State. The fat cattle now being prepared for market shows that early maturity has been secured, and that the profits to the farmer who raises stock is larger than at any former period, when he has availed himself of the best stock for feeding.

The dairy too, is evidently making creditable advances, and although much remains to be done to give in all our dairies a superior article of butter and cheese, still, our county societies show in their proceedings, that much has already been accomplished, and we look forward hopefully for the future.

In many of the counties the reports are in the highest degree creditable to the societies and the statements given useful and instructive, and of a character calculated to advance the great agricultural interest of our State.

Among the reports that are specially entitled to notice are those from Cattaraugus, Chautauque, Delaware, Jefferson, Livingston, Ontario, Queens, Steuben, Tompkins and Washington. The reports from the following counties are excellent: Clinton, Columbia, Cortland, Dutchess, Greene, Monroe, Niagara, Orange, Orleans, Oswego (from the two societies,) Otsego, Rensselaer, Saratoga, Schuyler, Tioga, Ulster, Warren and Wayne.

Some of the counties have merely sent in *a list* of their officers for 1859, without any report for the year 1858. It is very strange that the officers of the societies do not notice that the law of 1841, requires the president of the county societies to transmit, *annually*, to the Executive committee of the State society, "*all such reports* or *returns as they are required to demand and receive from applicants for premiums, together with an abstract of their pro-*

ceedings during the year." The law of 1855 requires the officers to transmit to the Secretary of the State Agricultural Society, by the 1st of February, "a statement of the Transactions of said society for the year, giving a full detail of the receipts and expenditures thereof, with a list of the premiums awarded, and to whom, and for what purpose, &c. Many of the societies send us a list, from the newspapers, of premiums awarded and monies received, without any reference to the business of the society during the year, without any statements of crops, or reports of committees, from which a report of the proceedings can be made out to the legislature as required by the law of 1841.

We would most respectfully call the attention of the officers of County Societies, to the reports which are referred to, as giving in the main, such statements as will enable the secretary of the State Society to make a report which shall fairly show what is the condition and progress of agriculture in each county of the State. This report should be made *separate* from the one giving the receipts, expenditures and list of premiums, which is designed to be filed with the Comptroller, as a basis upon which monies may be advanced on the proper affidavits. Should this be done in all the counties, as it has been substantially done in most of the counties above named, the Transactions would be far more interesting and valuable than they can now be made from the materials furnished.

It is gratifying that there are more valuable reports this year than usual, and it is confidently expected that hereafter, the reports will substantially conform to the requirements of the laws, and that in addition, a detailed and intelligent account of the condition and progress in agriculture will be given.

B. P. JOHNSON,
Corresponding Secretary.

AGRICULTURAL ROOMS.

We annex a circular from the Comptroller's office, for the guidance of officers in making their annual reports, which, it is desired, should be specially attended to.

COMPTROLLER'S OFFICE,
ALBANY, *February*, 1859.

Sir—The imperfect and insufficient manner in which many of the officers of the County Agricultural Societies have made the annual statements and accounts, required to be transmitted to this office, has induced the Comptroller to forward to you, for their information and guidance, the accompanying extracts from the laws of 1841 and 1855. By the law of 1855, the president, secretary and treasurer of each society are, on or before the first day of February, to make out and transmit to *the Secretary of the State Agricultural Society*, a statement of the transactions of the society for the year, giving a full detail of the receipts and expenditures thereof, with a list of the premiums awarded, and to whom and for what purpose, and the same shall be subscribed and sworn to by said officers.

By the second section of the law of 1841, the manner in which moneys are to be drawn upon the affidavits of the president and secretary is given: The secretary of the State Agricultural Society will transmit to the Comp-

troller the reports received by him in pursuance of the law of 1855, with his certificate that the said reports are in conformity with said act.

The laws undoubtedly contemplate that the foregoing requirements should be fully complied with by each society, before the Comptroller will be authorized to draw his warrant in its favor for any further portion of the State appropriation; and also, that the society shall have raised by voluntary subscription, independent of any previous balance or subscription, and to be expended for the benefit of the society in the same year, a sum at least equal to that to be received from the State. This must be made to appear by the affidavits of the president and treasurer, which must accompany the draft of the president for the State appropriation—forms for each of which are appended.

Very respectfully, your ob't serv't,

FORM OF AFFIDAVIT OF PRESIDENT AND TREASURER, AND ORDER TO DRAW MONEY.

County, ss:

A. B., president, and C. D., treasurer of the County Agricultural Society, being duly sworn, depose, and each for himself says, that during the present year, and since the last annual account rendered to the Comptroller, there has been raised by voluntary subscription, for the use and benefit of said society, and actually paid in or secured to be paid, the sum of dollars, exclusive of any previous subscription, or unexpended balance of any former year. Dated at the day of 185 .

Subscribed and sworn this day of 18 , before me,

Treasurer of the State of New York:

Pay to the order of C. D., treasurer of the County Agricultural Society, dollars, on account of the appropriation for the promotion of agriculture in said county, in pursuance of the Act, chapter 169, Laws of 1841. Dated at the day of 18 .

A. B.,

President of the County Agricultural Society.

AN ACT TO PROMOTE AGRICULTURE, PASSED MAY 5TH, 1841.

§ 2. When the New York State Agricultural Society, and any county Agricultural Society, now formed, or which may hereafter be formed in this State, or the New York Institute, in the city of New York, shall raise by voluntary subscription any sum of money, the president and treasurer shall make and subscribe an affidavit of the facts of the formation of such society, and of their having raised a certain sum, specifying the amount thereof, which affidavit shall be filed with the Comptroller of this State, who shall draw his warrant on the Treasurer for a sum equal to the amount of such voluntary subscription, not however exceeding the amount

to which such county or State society would be entitled, according to the apportionment aforesaid.

CHAPTER 425.

An act to facilitate the forming of Agricultural and Horticultural Societies. Passed April 13, 1855.

§ 9. The president, secretary, and treasurer of said society, shall annually, on or before the first day of February, make out and transmit to the secretary of the State Agricultural Society at Albany, a statement of the transactions of said Society for the year, giving a full detail of the receipts and expenditures thereof, with a list of the premiums awarded, and to whom, and for what purpose, and the same shall be subscribed and sworn to by said officers, before some person authorized to take the acknowledgment of deeds, as being a just and true statement within the spirit, true intent, and meaning of this act.

FORM OF AFFIDAVIT TO BE ANNEXED TO REPORT TO BE MADE TO SECRETARY STATE AGRICULTURAL SOCIETY.

County, ss:

A. B., president, C. D., secretary, and E. F., treasurer of Agricultural Society, being duly sworn, depose, and each for himself deposes, that the annexed statement of the transactions of the society, the receipts and expenditures of the same, and the list of premiums awarded, and to whom, and for what purpose, are in all respects just and true. Dated at the day of 18 .

Sworn and subscribed, this day of , 18 , before me, }

STATE AGRICULTURAL ROOMS, }
ALBANY, 18 . }

Sir—The Executive Committee have been much embarrassed in preparing their annual report to the Legislature, by the neglect of the officers of many county societies, in furnishing a statement of their proceedings, and of the state of agriculture in their respective counties. It is hoped that the officers will make their reports for the Transactions, *immediately* after their annual fair, giving a full account of their proceedings and of the state of agriculture generally; and the proceedings of their annual meetings in a subsequent return, with a list of the officers chosen for the ensuing year.

These returns are *in addition* to those required to be made to the Comptroller, as provided in the annexed circular from the Comptroller's Office.

The returns should be directed to the secretary of the State Agricultural Society.

Respectfully yours,

B. P. JOHNSON, *Cor. Secretary.*

To

President County Agricultural Society.

ALBANY.

The sixth annual fair of the Society was held upon Washington Square, in the city of Albany, on the 21st, 22d, 23d and 24th days of September, 1858.

The weather during the week of the exhibition was favorable, with the exception of Friday, which day was rainy and unpleasant, and of course had a tendency to lessen the receipts to some extent. As it was, however, the fair must be considered successful, a sufficient sum having been realized to meet all the obligations of the Society.

Although, as is usually the case, some dissatisfaction on the part of exhibitors was manifest, yet it is believed that the judges generally discharged their arduous duties in a manner which would justify the opinion that they *designed* to do justice to all; and that where erroneous decisions may possibly have been rendered, such results are more to be attributed to an undue interference or misrepresentation of the exhibitors themselves, than to any *intention* of the judges to show partiality, or otherwise to depart from the true line of duty.

In the stock department there were 274 exhibitors, who made 522 entries, embracing some of the finest stock to be found in the State. The animals exhibited were the following, viz.: horses, 281; cattle, 124; sheep, 59; swine, 34; fowls, 388; rabbits, 16; elks, 2; the residue consisting of squirrels, ferrets, pigeons, canaries, doves, &c.

In the horticultural department there were 89 exhibitors, making 307 entries. While this portion of the exhibition was good, embracing as it did a considerable variety of choice plants, fruits and vegetables, yet it was not by far what the county of Albany could and should produce.

In the domestic department there were 141 exhibitors, and 310 entries made, comprising a very extended variety of articles, the product of the persevering industry and talent of the county.

In the manufacturers' department there were 53 exhibitors, making 351 entries. Much praise is due to the manufacturers of stoves, ranges, &c., for their very liberal contributions in this department, their exhibition being universally conceded the best ever made at our county fair. Although there were a considerable variety of agricultural implements shown, but two of our manufacturers in this branch of mechanical industry were represented. When we take into consideration the fact that there is no portion of our show more interesting and beneficial to the farmer than a judiciously extended list of the implements of husbandry, it is surprising that a more brisk competition is not manifested.

The total receipts at the fair amount to $3,608.87; balance on hand from previous year, including the receipts at annual meeting, 1858, $103.11; total, $3,711.98. As I have been unable to obtain from the Treasurer a correct report of his disbursements, it is impossible to give a true statement of the *financial condition* of the Society.

The following officers were elected at the annual meeting held in January, 1859, viz.:

President, Wm. Hurst, Albany; Vice-President, Richard Kimmey, Bethlehem; Secretary, Jacob C. Cuyler, Albany; Treasurer, Horace L. Emery, Albany; Directors, John Cutler, Albany, Joseph Hilton, New Scotland.

Respectfully submitted.

A. F. CHATFIELD, *Secretary.*

ALLEGANY.

ANGELICA, *March* 9, 1859.

B. P. JOHNSON, Esq., *Secretary:*

Dear sir—The officers of the Allegany County Agricultural Society for 1859, are as follows:

William Wilson, President; A. B. Hull, Secretary; D. D. Gardiner, Treasurer, and seven Directors.

The annual fair was held at Angelica, Sept. 29th and 30th. The attendance was large, and the exhibition, in nearly every department, creditable to the county. The show of cattle was unusually fine.

We expect to organize, during the present month, under the laws of 1855. Under the present arrangement, the Society elected officers, as required, to make the annual report of fairs, about which they may know little or nothing. We hope to remedy this in future.

1858.	Receipts,	$353 09
	Disbursements,	221 30

A. B. HULL, *Secretary..*

BROOME.

The Society in this county was organized in 1858 under the law of 1855, and held its first fair Sept. 28 to 30, and was a very successful one.

Whole amout of receipts,	$932 79
Expenditures,	660 42
	$272 37

Mason Watkins, President; W. L. Peck, Secretary; J. H. French, Treasurer.

CATTARAUGUS.

Hon. B. P. JOHNSON, *Secretary New York State Agricultural Society:*

Sir—The following statement of the operations of the Cattaraugus County Agricultural and Horticultural Society, for the year 1858, is respectfully submitted.

The account of the receipts, expenditures, premiums awarded, &c., as required by law, will he forwarded in a separate report.

Very respectfully your obedient servant,

JOHN MANLEY, *Secretary.*

LITTLE VALLEY, 1859.

The seventeenth annual fair of the Cattaraugus County Agricultural and Horticultural Society, was held on the spacious grounds of the society,

in the village of Little Valley, on the 28th, 29th, and 30th days of September. The society also held a horse show at the same place, on the 25th and 26th days of August.

The horse show was thrown open to exhibitors from the surrounding counties of this State and Pennsylvania, and was represented by some seventy exhibitors, who presented about eighty animals, of various ages, of decidedly fine quality, and many well bred ones of the Black-Hawk and Messenger strains. The attendance on the second day was quite large; the competition was kept up with the spirit which all such exhibitions must incite in the admirers of the noblest of Domestic animals. The exhibition was pecuniarily successful, and closed with an address by Hon. Wm. Pitt Angel, in which was sketched the history of the horse, illustrating his varied uses, interspersed with characteristic anecdotes of his sagacity. The orator urged the breeder to exercise the care, skill and judgment necessary to make his

"——— horse excel a common one,
In shape, in courage, color, pace and bone.
* * * * * *
"Round-hoof'd, short-jointed, fetlocks shag and long,
Broad breast, full eyes, small head, and nostrils wide,
High crest, short ears, straight legs, and passing strong,
Thin mane, thick tail, broad buttock, tender hide:
Look, what a horse should have, he will not lack,
Save a proud rider on so proud a back."—[*Shakspeare.*

The weather, during the latter part of the annual fair, was rainy, but notwithstanding this unfavorable circumstance, the attendance was quite large, and the entries exceeded any previous fair. Blood cattle showed a marked improvement in numbers and quality upon any previous exhibition, the Devons leading in thoroughness of breeding, followed by Durhams and Ayrshires. No Herefords or Alderneys are yet owned in the county. The working oxen, steers, grade cows and heifers, were well represented. In sheep the South-Downs and Leicesters, with their grades, prevail, followed by remote crosses from Spanish or French Merinos. The show of horses was good, though not, of course, equalling the exclusive horse show of August last.

In the mechanical department a marked improvement was apparent over any previous exhibitions. In the line of farming tools, carriages, farm wagons, machinery, leather, &c., the hand of the skillful workman was manifest.

The tent exhibition, comprising the ladies' department, was superior to any previous fair. The large tent, covering 5,000 feet ground surface, was literally filled with the works of tasteful hands, and the productions of the fields and of the dairy.

From statements submitted by competitors on dairy products, the following extracts are given:

Nathaniel Manley, of Mansfield, to whom was awarded the first premium for cheese, owns an upland farm of 350 acres, which is conveniently divided

into pastures, meadows and tillage lots. The stock barn is forty by ninety feet, situated on sloping ground, so that a basement cow stable is secured running the entire length of the barn, fitted with double rows of stanchions, giving convenient and well ventilated accommodations for sixty cows. The dairy, at present, consists of forty cows, and the amount of cheese per cow will average about 500 pounds.

"The apparatus for making the cheese is a square tin vat, set in a wooden one, enough larger to admit water in the space between the tin and wooden vats, to cool the milk, or cool the curd, as the case may be. Under the vat is a cylinder cast iron tubular boiler, bolted to metal plates on the wooden vat, for heating the water in the space between the wooden and tin vats, for cooking the curd. Less than a half bushel of fuel is sufficient for an hundred pound cheese.

"My mode of making cheese is to strain the night's milk into the vat above described, and filling the vacuum between the vats with cold water. In the morning the cream is taken off and the morning's milk is added; the cream previously taken off is reduced to the consistency of milk and added to the milk in the vat, when the whole is warmed to eighty-two degrees. The rennet is then added and allowed to stand fifty minutes. The curd is broken and left to stand for ten minutes, when it is again carefully broken and left to settle; the whey is then partially drawn off, the curd again broken fine, the heat raised to 100 to 104 degrees; the curd is kept moving in the remaining whey while scalding for about thirty minutes, or until sufficiently scalded, which is known to the experienced by tasting or feeling. The remainder of the whey is drawn off, and the curd worked and cooled with cold whey until it is nearly cold; it is then salted with Onondaga salt, at the rate of a tea-cup full of salt to sixteen pounds of curd, varying some in amount of salt with the moistness of the curd. The curd is placed in the hoop and pressed for two or three hours, taken out, the bandage put on, the cheese turned and again pressed."

Joseph Smith, of Mansfield, to whom was awarded the second premium on cheese, and to whom was awarded the first premium of twenty dollars at the New York State Fair, at Buffalo, in 1857, occupies a level farm, containing about 300 acres, watered by a branch of the Cattaraugus creek. He purchased the farm about sixteen years ago. Mr. Smith was a laborer upon the New York and Erie railroad at the time of the failure of that company in 1841–2, and with most of the men, did not get the pay due for his labor, but having an energetic woman for a wife (such as all young farmers should have), and possessing no other property but a span of horses, the two brave hearts and four strong hands of himself and wife, he began farming in a small way, gradually improving his buildings and adding to his possessions, until now he has one of the handsomest farms in the county. The dairy consists of forty cows, averaging five hundred pounds of cheese per cow. Mr. Smith's method of making cheese is substantially the same as Mr. N. Manley's, detailed above, save that the former uses a "tea-cup of Ashton's Liverpool salt to eighteen pounds

of curd, scalds to ninety-eight degrees, and presses his cheese lightly at first, puts on the bandage, and then presses well for two days."

Zina Dudley, of Napoli, to whom was awarded the first premium on butter, occupies a hilly farm, with good pasturage, well supplied with pure water. His method of making butter is—"as soon as the milk is drawn from the cows it is strained through a fine wire strainer into pans holding about eight quarts each, the pans set on racks, and remain there until sour. My milk room has a stone floor. After churning the butter is gathered, washed until free from butter-milk, salted at the rate of fourteen ounces (Ashton's Liverpool) salt to sixteen pounds of butter. It is then worked lightly, put in the cellar till the next morning, when it is again worked and packed in tubs; a cloth is spread over the top and slightly covered with salt, which is always kept moist until taken to market."

Samuel T. Kelsey, of Great Valley, was awarded a special premium for a fine lot of evergreens and fruit trees. We recently visited Mr. Kelsey's farm and nursery, and were agreeably surprised to see so large and fine a stock of fruit, evergreen and deciduous ornamental trees, shrubs, small fruits, &c., as we here found growing at the end of three and a half years from the founding of the nursery. This nursery is quite a novelty in this section; the evergreens and deciduous forest trees of this locality are largely cultivated for western trade. About twenty acres are occupied, and, at the time of our visit, a large number of hands were employed in planting out a recent importation of 150,000 larches, Norway spruces, Austrian and Scotch pines, Swedish junipers, &c. About 1,000,000 trees are growing on these grounds.

Hon. Reuben E. Fenton, member of Congress from this district, delivered the annual address, which was a well written document, stored with good sense and practical suggestions, worthy the author as a sound reasoner, a skillful farmer—a model one, Col. F. has the credit of being—and an energetic business man.

From the treasurer's report the finances of the year 1858 are:

Receipts.—Horse show,	$392 20
Annual fair,	494 18
Rent of tent,	30 00
State appropriation,	86 00
	$1,002 38
Expenditures.—Horse show,	$357 33
Annual fair,	677 13
	$1,034 46
Balance due treasurer,	32 08

Officers for 1859.

Nathaniel Walker, President, Mansfield (Eddyville P. O.); Lorenzo Stratton, Vice-President, Little Valley; John Manley, Secretary, Little Valley; Horace S. Huntley, Treasurer, Little Valley; six Directors and thirty town Vice-Presidents. JOHN MANLEY, *Secretary.*

CHAUTAUQUE.

The annual fair was held at Fredonia, September 21st, 22d and 23d. Over $1,200 were offered, and over $1,000 were paid in premiums. The entries in all the various departments were excellent, and numbered 1,434, being an increase of 500 over that of previous year.

The show of stock surpassed all former exhibitions. The exhibition of sheep could have successfully challenged competition with that of any State fair, in the superior excellence of the animals exhibited.

In domestic manufactures of every branch, the display in like manner surpassed every previous exhibition.

In the mechanical department, in doors and out, there was a great and satisfactory variety, from mowing machines down (*or up*) to sewing machines.

The dairy department was well, and in quality, finely represented.

The vegetable and fruit department exhibited varied and superb collections; indeed, every department was fully and creditably represented, and in every respect the annual fair of 1858, was truly a successful one, commanding approbation by its merit, and attracting admiration by its interest.

The annual address was delivered by the Hon. A. B. Dickinson, of Steuben county, and was practical, interesting and useful, abounding in suggestions and illustrations that invited the attention and commanded the approbation of the large body of agriculturists who were privileged to hear it.

The attendance on each of the last two days numbered at least 1,500 persons.

The annual meeting of the executive committee for awarding the premiums on crops, was held in the month of December, and premiums to the amount of thirty-eight dollars ($38) were awarded.

I enclose statements made by exhibitors of field crops, among them that of W. A. Mayborn, showing a yield of 103 bushels of shelled corn per acre.

It was voted to hold the fair another year at Jamestown.

The following are the officers for 1859:

Augustus F. Allen, President, Jamestown; Sidney Jones, Secretary, Jamestown; Richard H. Barker, Treasurer, Jamestown.

The treasurer's books show the following state of the finances:

Receipts,	$2,057 95
Disbursments,	1,976 77
Cash on hand,	$81 18

NELSON GORHAM, *Secretary.*

FREDONIA, *March 11th*, 1859.

CORN STATEMENT.—W. A. MAYBORN.

The following is a statement of the culture and management of the two acres and 7-100 of ground planted with corn; also enclosed is the survey of the same. The two previous years the ground had been to wheat. In the winter of 1857 and 1858, I drew some fifty loads of green manure to

the acre; the first week in April the manure was ploughed under six inches in depth; it was well harrowed and ready to plant by the 20th of May; commenced planting 23d of May—planted one-third of the piece; May 29th, planted about the same quantity; May 31st, finished the piece; the corn was planted north and south, rows 3 feet apart by 2½ feet; from 6 to 8 kernels was planted in the hill; the corn was from 5 to 6 days in coming up; on the 14th of June commenced plowing with the cultivator one way; finished hoeing June 19th for the first time; left from three to four stalks to the hill; June 27th, went through it again with cultivator; finished hoeing June 30th; the first week in August picked corn to boil; September 12th, commenced cutting it up; put it in shocks of twenty hills in shock; on the whole piece there were some six hundred shocks; Sept. 26th, commenced husking; the corn was all of it drawn to the barn to be husked; when husked was thrown in heap, measured carefully in a basket and put away. The corn measured when husked, 327 baskets of sound corn; there were of small ears and unsound corn 33 baskets; of seed corn trussed up 8 baskets; total 368 baskets. On the 7th of November, I shelled one basket, making ½ bushel and 6 quarts which weighed 36 lbs.; by measure I make 253 bushels of shelled corn; by weight, 56 lbs. per bushel, I make 236 bushels. The variety planted was the King Philip.

W. A. MAYBORN.

MAYVILLE, Dec. 7, 1858.

Chautauque county, ss:

William A. Mayborn, being duly sworn, says that the facts set forth in the foregoing statement, by him subscribed, are true.

W. A. MAYBORN.

Sworn before me this day of December, 1858.

W. GREEN, *Justice of the Peace.*

I would state that I drew the manure, plowed the ground, assisted in planting, hoeing, cutting of the corn, and husking the same; that I carefully measured the corn when husked; that I shelled the basket of corn, measured it and weighed the same; that I also assisted in measuring the ground, and know the aforesaid statement of the number of baskets, and what was shelled; also the enclosed survey to be correct.

F. HELLER.

MAYVILLE, *Dec. 7th*, 1858.

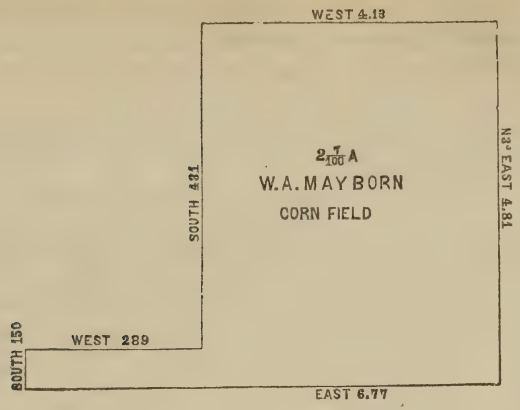
Chautauque county, ss:

John Heller being duly sworn, says that the facts stated in the foregoing statement, by him signed, are true.

F. HELLER.

Sworn before me this 11th day of December, 1858.

W. GREEN, *Justice of the Peace.*



Chautauque county, ss:

William A Mayborn, being duly sworn, says that the above is a true plot and survey of the cornfield mentioned in the annexed statement, that said field was accurately measured by him, assisted by John Heller, with a fifty link chain belonging to W. Green, surveyor.

Sworn before me this 7th day of December, 1858. } W. A. MAYBORN.

W. GREEN, *Justice of the Peace.*

I certify that I have compared the chain mentioned in the above affidavit with the State standard, and that is a half chain 33 feet in length, and I further certify that I have estimated the quantity contained in the within mentioned cornfield, and that it contains according to the courses and distances, two acres and seven-hundredths of an acre.

Dated, *December 7th*, 1858. W. GREEN, *Surveyor.*

STATEMENT OF ONE ACRE OF CORN RAISED BY J. C. BATES IN 1858.

Soil, sandy gravel greensward ; manure, long or green, twelve loads per acre, spread and immediately plowed in eight or nine inches deep ; rolled, harrowed and marked out three and a half by four feet ; planted 15th of May, six grains per hill, and thinned out at hoeing to four stalks. Variety, large eight-rowed yellow. Cultivated both ways, and *well hoed twice.* Plaster applied to the hills after the first hoeing. Cut up and harvested in the usual manner. Product, eighty-nine bushels and twelve pounds, of fifty-eight pounds to the bushels.

Account with crop.	*Dr.*
To manure,	$6 00
rent of land,	7 00
preparing,	3 00
planting and seed,	75
hoeing,	3 50
cutting up,	1 00
harvesting,	6 50
	$28 75

	Cr.
By 89 bushels and 12 pounds of corn, at 5s.,	$55 75
Deduct cost,	28 75
Profit,	$17 00

Allowing the stalks to pay for the plaster, putting it on, and for cribbing and other incidental expenses.

Remarks.

Believing that to pet one acre and *starve* the rest of the farm, is bad policy, and does not develop any science in farming, I have long since adopted the plan of treating the whole field alike, which I did in this instance, (a field containing eight acres,) and then select the best acre for presentation. This may account in some measure for the smallness of the product. Had I doubled the manure on this acre, a greater yield could have been obtained, but where would have been the corn on the next acre? This system will not do for me.

All of which is respectfully submitted to the committee of field crops of the Chautauque County Agricultural Society.

J. C. BATES.

Dated at SHERIDAN, *Dec.* 11*th*, 1858.

Chautauque county, ss:

J. C. Bates, being by me duly sworn, says that the above statement is substantially true and correct. J. C. BATES.

Sworn before me this eleventh day of December, 1858.

R. A. SHELBY, *Justice of the Peace.*

J. G. GRISWOLD'S STATEMENT OF CORN, BARLEY AND OATS.

One acre of eight-rowed yellow corn:

Number of bushels of ears when husked,	144
One-tenth shrinkage, leaving	129 1-2
Pounds of shelled corn per bushel of ears,	34 1-2
Number of bushels shelled corn,	76 42-54

One acre of eight-rowed white corn:

Number of bushels of corn when husked,	150
One-tenth shrinkage, leaving	135
Pounds of shelled corn per bushel of ears,	33
Number of bushels shelled corn,	76 47-54
One acre of four-rowed barley, bushels,	45
do do do do	41 1-2
do of oats,	50
do do	47 1-2

The soil of the corn ground is a gravelly loam. A stiff June grass sward was turned under eight inches deep just before planting. Rows three and a half feet apart each way. Hoed twice and cultivated both ways each time, and the ground kept as level as possible. Had been pastured six years; the clover and timothy had run out, and the June grass had made a thick matted turf, full of fibrous roots, and the corn had no other manure; but the yellow cornfield had been irrigated by flowing the water

from a blind drain over it occasionally while it was in pasture, which I think accounts in some measure for the superior weight of the yellow corn, though others may think differently; but the corn on the irrigated ground certainly appeared to be more solid and compact on the cob, and had a brighter polish, than the same yellow corn in that part of the field not accessible to the water. Had the dry part of the field been manured, perhaps I might not have perceived the difference.

The barley and oat ground is a mixed soil, formed in part from the sediment of slate and clay washed from the stone quarries on to a stony bottom, and requires thorough cultivation, and last spring was very unfavorable for the work, which delayed the time of sowing, and which had a tendency to materially lessen the weight of those two kinds of grain, and no doubt diminished the crop one quarter.

All which is respectfully submitted.

J. E. GRISWOLD.

I hereby certify that I assisted in surveying the above mentioned ground, and in measuring and weighing the grain, and that the above is substantially correct. J. E. GRISWOLD,
D. GRISWOLD.

SHERIDAN, *Dec. 13th*, 1858.

State of New York, Chautauque county:

John E. Griswold, of Sheridan, in said county, being duly sworn says that the foregoing statement of quantities and weights of field crops, raised by him during the season of 1858, is just and true, and that the mode of cultivation, and condition and quality of soil on which the said crops were raised, is also true. J. E. GRISWOLD.

Subscribed and sworn to before me,
December 14th, 1858.

CHAS. F. MATTESON, *Special Surrogate, Chaut. Co., N. Y.*

STATEMENT OF DE AZRO A. NICHOLS, RESPECTING A FIELD OF WINTER WHEAT.

This field had been in clover, and had been mowed two years. It was broken up seven inches deep during the last week in August, 1857, and sowed the 8th September. About three acres were drilled, and the remainder was sown broadcast; this was done in order to test the relative value of drilling as compared with broadcast sowing. This experiment resulted in favor of the use of the drill. I cannot state the exact quantity per acre gained by the use of the drill, but my neighbors generally estimated it at five bushels per acre; it certainly was no less. The soil is gravelley loam, and no manure was used except a fine crop of clover, in blossom at the time of plowing. The wheat was harvested in July by a reaper, and thrashed in August with a Pitt's separator. The whole yield of clean wheat was 155¼ bushels, weighing 63 lbs. per bushel. The most of the wheat was sold for seed at an average of $1.53 per bushel. Yield per acre a little more than 31 7-10 bushels by measure, and 33 289-1000 by weight (60 lbs. per bushel). Amount of land is 4 897-1000 acres.

Cost and profits.

	Dr.
Plowing, dragging and drilling,	$32 00
Seed (1¾ bush. per acre at $1.25),	10 62
Harvesting and thrashing,	34 60
Interest on land and taxes (70 per cent),	34 28
Total cost of crop,	$111 50
	Cr.
By 155¼ bushels wheat, at $1.53,	$237 53
Straw (estimated),	15 00
Total yield,	$252 53
Total cost,	111 50
Total profit,	$141 03

Or at the rate, per acre, of $28.79.

The above is a true and accurate statement, according to the best of my knowledge and ability.

DE AZRO A. NICHOLS.

WESTFIELD, N. Y., *Dec.* 20, 1858.

Sworn and subscribed before me this 20th day of December, 1858.

WILLIAM SEXTON, *Justice of the Peace.*

WHEAT.—STATEMENT OF JOHN L. HOLLISTER.

A field of winter wheat:	Dr.
To Interest on 3 5-100 acres of land, at $100 per acre,	$21 32
Four days plowing, at 16s.,	8 00
One day's cultivating, 16s.,	2 00
Nineteen loads leached ashes, at 2s.,	4 75
Three and three-fourths days drawing ashes, at 16s.,	7 50
Clover plowed in,	15 00
Six and a quarter bushels seed wheat, at 12s.,	9 38
Sowing and harrowing,	3 50
Five days harvesting, at 10s.,	6 25
Drawing wheat,	3 00
Thrashing 106¾ bushels, at 10s.,	10 67
Hauling to market,	2 00
Total,	$93 37
Same field:	Cr.
By Eighty-three bushels wheat, at 12s.,	$124 50
Twenty-three and three quarter bushels wheat, at 10s.,	29 69
Straw,	15 00
Total,	$169 19

The process was as follows: plowed in over one ton per acre; plowed once in July; put on ashes; sowed about the 6th of September.

HORACE HOLLISTER.

We, the undersigned, measured said wheat, and the amount by measure was 106 bushels 24 quarts, averaging about 59 lbs. per. bushels.

JOHN Q. HOLLISTER.
JOHN THOMPSON.

Sworn before me this 1st day of September, 1858.

WILLIAM ALLIS, *Justice of the Peaee.*

I, Silas Spencer, of Westfield, in the county of Chautauque and State of New York, do on my oath declare that I am a practical surveyor, and that I carefully surveyed and measured the land above described, preparatory to the application for the premium therein claimed, and do find the amount of land to be *three acres and five-hundredths of an acre.*

Given under my hand the 31st day of August, 1858.

SILAS SPENCER, *Surveyor.*

Sworn before me this 31st day of August, 1858.

WILLIAM ALLIS, *Justice of the Peace.*

CAYUGA.

The Cayuga County Agricultural and Horticultural Society held its annual fair at Auburn, September 29th and 30th, and October 1, 1858. The weather for a few days before the fair was quite unpropitious. The first day and up to 2 o'clock P. M. of the second day, was very pleasant. At that hour a violent storm set in (which continued through the remainder of the fair,) and drove all visitors and committees from the ground, and such persons as could secure a place in the buildings on the ground were considered fortunate.

The storm cut off further exhibition of stock and implements, as there was an unusual fine display on the grounds.

Such a storm attests the propriety of having secure and permanent buildings for the protection of property on exhibition. Such a building has been erected on the grounds of this society at a cost of about $3,000.

The annual address was delivered by the Hon. Alexander S. Diven, of Elmira, was a sound and practical production and was listened to with profound interest, a copy of which was requested for publication, which we hand you herewith. The receipts of fair were $805.55. The exhibition of domestic manufactures, fruit, flowers, vegetables, butter and cheese, was very fine and excelled any former exhibition.

The annual meeting of the society was held December 11, 1858. The following persons were elected officers for the ensuing year:

For President—Henry W. Dwight, Aurelius, post office, Auburn; Vice-President—Wm. D. Osborn, Mentz, post office, Port Byron; Secretary—L. C. Munn, Auburn; Treasurer—H. F. Cook, Auburn; and six directors.

H. W. DWIGHT, *President.*

L. C. MUNN, *Secretary.*

CHENANGO.

NORWICH, *January* 8, 1859.

B. P. JOHNSON, *Secretary New York State Agricultural Society:*

Dear Sir—Our thirteenth annual fair of the Chenango County Agricultural Society was held at Norwich on the 22d, 23d and 24th days of September last, was well attended despite the decidedly bad weather, which must have damaged our receipts very much. Our entries were larger than usual, and I think, superior in quality. The *stock* department exceeded any former show of the society.

The *mechanical* and *floral* part of the exhibition was well supplied with the *ingenuity* and labor of the citizens of the county. All who witnessed the exhibition will agree with me that the various animals and articles shown were an improvement on former exhibitions, and therefore encouraging to the society.

The annual address was delivered by Solon Robinson, whose name only needs be mentioned to recommend the address to the reading public.

Our financial department was very much injured by the bad weather of the last day of the fair.

Balance in treasurer's hands, December, 1857,	$111 81
To amount received from Treasurer of the State,	122 00
406 members of the society,	406 00
Gates,	281 36
Citizens of Norwich,	202 00
Rent on fair grounds,	59 50
President Rufus Chandler,	10 00
Secretary J. Wells,	5 00
Gilbert Sanford,	2 00
	$1,199 67

Contra.

Paid 301 premiums and claims against the society,	$1,178 84	
Balance in my hands December 30, 1858,	20 83	
		$1,199 67

We can safely report progress, I think, in agricultural improvements for the past year, in our county and society, and hope to keep pace at *least* with our neighboring counties, in improvements and the useful arts.

Yours, with great respect,

J. WELLS, *Secretary*,

Chenango County Agricultural Society.

CLINTON.

The annual exhibition was held at the U. S. Barracks, Plattsburgh, Sept. 9th, 10th, and 11th, and was in every respect the largest and best ever held in that section of the State. The weather was favorable, and the exhibition

attractive, and the attendance very large. Agriculture in all its branches, with its cattle, horses, sheep, swine and poultry, its butter, cheese and honey, with implements and machinery; horticulture, with fruit, flowers and vegetables, and the fine arts to no inconsiderable extent, combined to fill the spacious grounds, and erections occupied for the occasion. The grounds were conveniently arranged, the barracks were trimmed with evergreens, all contributing to the attractive features of the whole exhibition.

Floral Hall, admirably arranged and attractively fitted, was thronged with visitors. The exhibition of fruit was worthy of especial mention. John W. Bailey exhibited nearly 200 varieties of apples, and Jonathan Battey upwards of 100 varieties of pears, and an equal good show of apples and grapes.

The first day was mainly devoted to preliminary arrangements, and the attendance was mostly members of the society. The second day there was a general exhibition of the stock, and the committees attended to the their examinations.

The celebration of the anniversary of the battle of Plattsburgh, on the 11th September, the third day, was mostly devoted to its commemoration, and the exercises were deeply interesting. Major General John E. Wool, and Commodore Paulding, U. S. N., who were engaged in the defence of Plattsburgh, were among the invited guests. The grounds of the Society were thrown open to the public, and from six to ten thousand were in attendance. The exercises were of a very interesting character, and the addresses of G. H. Beckwith, welcoming the guests, General Wool, John L. Stetson, and Commodore Paulding, were all of them of great interest, and were received with the most enthusiastic cheers from the persons in attendance.

After the close of these ceremonies, and an examination of the exhibition by the guests of the society, they returned to the platform, when the annual address before the society was delivered by D. S. McMasters, Esq. After a rapid and very interesting sketch of the progress of our country since 1776, showing the triumph and onward march of improvement in our country in every department, he concludes with an address specially to the society.

"Gentlemen, we live in the practical age of the world. Among other things, the subject of agriculture is beginning to receive that attention and encouragement from individuals and governments which its importance demands. The farmer of the present day is a different being from what he was fifty years ago. Formerly he derived his information from limited personal observation and actual experiment; but now, he brings to his aid the discoveries made by agricultural chemistry; and, by means of various agricultural publications, has the benefit of the observations and experience of the world. He has ceased to be a mere machine of "bone and muscle,"

and has become a reading, thinking, experimenting, practical man—a capitalist and a freeholder.

Chemistry has analyzed the soils of the uplands and the valleys—told him the component and relative parts of the clay soil, the sandy and the loam. Chemistry has also analyzed the various straws producing the various kinds of grains, and the various kinds of grains themselves; carefully compared the ingredients of the product with the elements found to exist in the different kind of soils producing them, and thus enabled the farmer of the present day to improve his stock of practical knowledge by scientific experiments. Experience long since taught the farmer that a succession of annual crops of the same kind would exhaust the soil, but the reason of the exhaustion was left for chemistry to discover and explain. Instead of allowing lands to lie idle to recover the elements abstracted by former crops, experience enlightened by science, resorts to a rotation of crops and a proper system of manuring, and thus compels the same land annually to produce to its utmost capacity.

To awaken a proper interest among the farmers, and promote an increase of practical and scientific knowledge, the State annually distributes money to county societies to be awarded in premiums; publishes the reports and observations of committees and individuals upon every subject calculated to increase the amount of production and improve the knowledge of the produce.

Stimulated by a desire for further and better knowledge, agricultural societies have been formed for mutual benefit and improvement. The general government for a few years past has collected seeds and grains from every part of the world, and distributed them all over the country for introduction and experiment.

In 1845 it was maintained by the farmers that the State ought to establish an agricultural school, in connection with a model farm, for the education of those who desired, in the *science* and *practice* of farming. So various and irreconcilable were the opinions of eminent men, upon the utility of the plan proposed, that the project was abandoned.

The State maintains a Normal school for the education of teachers; the State enlarges an Erie canal to transport the produce of the western farmer to the seaboard; the State compiles school laws and publishes colonial, geological and documentary histories, and taxes the people to defray the expenses.

Would it be unreasonable to require the State to establish an institution for the education of farmers in the art and science of farming? Would it be unreasonable to require the State to furnish a text-book upon farming? Might not much useful information be disseminated among the farmers at moderate expense, as to the best mode of farming; the best kinds of grains, swine, sheep and cattle, and the most approved modes of cultivation and treatment? Would it be unreasonable to require the State to qualify men for the business at the agricultural school, and send them to lecture to the people in towns?

The farmer wants authority as well as the lawyer. You question the opinion of a lawyer and he refers you to the decisions of courts. They are his authority. You ask the gardener why he adopts a particular mode of cultivation for a given tree, plant, vine or vegetable, and he will refer you to his work on horticulture. Ask the mechanic why he cuts here or cuts there, and he will refer you to his plan and style of architecture. But ask the farmer why there is more nourishment in a bean than a carrot? Why there is more nourishment in one kind of grain or vegetable than another? What elements of soil are required for the growth of wheat and all the different varieties of grains and vegetables? Why it is and what it is that clothes the forest in green and gives the flowers their various colors? He will tell you that these are difficult questions to answer in the present state of our knowledge.

But put a scientific treatise into the library of any family in Clinton county, and the children would answer these questions in less than three weeks.

By means of a proper text-book upon the best modes of farming in all its branches, the annual produce of the State would be increased four-fold in less than three years. As agriculture precedes civilization, so knowledge precedes improvement in every branch of business. With a water-power sufficient to drive the machinery of the world; with inexhaustable sources of mineral wealth, discovered and undiscovered, in the county; with immense regions of timber yet to be manufactured; with manufacturing establishments all over the county, furnishing profitable employment for labor, and profitable investment for capital; with a local market consuming the entire surplus produce of the county, and expending abroad half a million, annually, to supply the deficiency; with a healthy climate and productive soil, the farmers of Clinton county have every encouragement to increase the amount of production and the profits of their labor.

Mr. President, Ladies and Gentlemen: I thank you for the kind attention you have bestowed, and in conclusion, allow me to express a fervent wish for the *prosperity of the Agricultural Society of Clinton County; success to her sons and daughters in every honorable employment; success to education and labor in all their departments.*

After the address of Mr. McMasters, the awards were announced. The exercises of the day were concluded by a dinner at the Cumberland House.

At the dinner, in answer to sentiments given, appropriate remarks were made by Commodore Paulding, Wm. Swetland, Esq., D. S. McMasters, Esq., G. H. Beckwith, Esq., and J. H. Sanborn, President of the Society, in response to a toast, "The President of the Agricultural Society of Clinton County," remarked:

Gentlemen—As a member of the Agricultural Society of Clinton county, and having been placed at the head of the society by the partiality and kindness of the farmers who have co-operated for the elevation and advancement of the art and science of agriculture; it is to the great body of

farmers constituting this society which has now closed its annual exhibition, alike creditable to themselves and the county, that I should briefly acknowledge the compliment embraced in the sentiment offered.

But the occasion does not justify, or time permit me to enter upon a history of the progress of agriculture in this county, and the rapid advancement and improvement made, in various ways, within the past few years.

It is a source of gratification to me that my efforts, though feeble, as president of the society, are so kindly appreciated. The sentiment so kindly expressed is deserved by the great body of farmers who have greatly improved, and are still advancing towards perfection in the most important and useful of all occupations, the cultivation of the soil, which feeds all, clothes all, and furnishes the elements of individual independence, national wealth and prosperity. Tell me the condition of a nation's agriculture, and I will tell you the condition of *that* nation's mind and enterprise. Tell me that the agriculture of the people of any particular county in the State is improving, and I will tell you that the public mind is onward in other departments of knowledge, and rising higher in intellectual attainments.

Gentlemen, I receive the sentiment as complimentary to the farmers of Clinton county, and in conclusion, allow me to express a fervent wish for the prosperity and further advancement of the agriculture of this county.

WINTER MEETING.

Officers for 1859.—Alonzo D. Barker, President, East Beekmantown; John L. Stetson, Secretary, Plattsbugh; William P. Mooers, Treasurer, Plattsburgh. J. L. STETSON, *Secretary.*

COLUMBIA.

The annual fair of the Columbia County Agricultural and Horticultural Society was held on the grounds of the society at Chatham Four Corners, on the 29th and 30th of September, and 1st of October, 1858. Our society is in a highly flourishing and prosperous condition, as will be seen by the increased receipts, and was manifested during the fair by the number and excellence of the articles and stock exhibited. In view of the increased interest evinced in the success of the fair, and the competition manifested in the exhibition of the contributors, not only in stock, in improved farm implements, grains, roots, vegetables, seeds, &c., but in the mechanical and fancy department, the society flatters itself to be able, in a few years, to compete successfully with any county in the State.

The only embarrassment at present to make our society what it should be, is a debt for grounds, building and fixtures, existing, to the amount of $3,500, which, if discharged, would leave a large amount to increase the premiums and offer greater inducements to our farmers from a distance.

The exhibition of cattle was superior to that of any previous show, both as to quantity and quality, with a greater variety of breeds, and some for beauty of proportion and symmetry of figure could not well be excelled, the most attractive of which were the Durhams, Devons and Herefords. There were some crosses very little inferior to the full bloods. There were 153 entries of which twenty-eight were fat cattle, among which were sixteen Herefords, fed by James Van Alstyne, of Ghent, which attracted much attention. Visitors from other counties said they had never seen so great a show of cattle at a county fair, and a few even flattered the society that it exceeded the exhibition at the State fair of 1857.

The show of horses was very fine. Our farmers seem to pride themselves in raising good horses, and for the last six or eight years, have taken great pains to breed from the best blood; the Black-hawk, Jackson and Morgan, taking the preference, which here are considered good farm horses, and prove themselves very superior roadsters. We have on the grounds a fine half mile track which affords those who fancy the sport, an opportunity to gratify themselves. In this department there were 112 entries.

In sheep the show was good but rather small. There were thirty-one entries consisting of Saxon, Merino, South-Down, Leicester and Long-wool, which were very superior of the kind.

In swine there were twenty-one entries mostly in lots comprising some very fine specimens of the genus "Sus," the Suffolk chiefly taking the lead.

In poultry the show was very small in consequence of having been overlooked by the society for a few years past in advertising the list of premiums offered. This being the first year that a specific list of premiums was offered, which if continued will make this part of the exhibition what it should be by another year.

In dairy products the show was good as to quality but small in quantity, and would compare but meagerly with this department in some of the western dairy counties.

Fruits and flowers were well represented for the season. Our fruit in the county is biennial, and this was the barren year, still many were happily disappointed in finding so fine specimens and so great a variety.

Farm implements for facilitating the work of the farmer and improving the manner of cultivating the soil, were very well represented. There were twenty-nine entries, consisting of the most approved mowers, reapers, cultivators, planters, sowers, plows, &c.

Farm products, as roots, seeds and grain, had their share, and were very creditable, some very fine specimens being exhibited, but small as to quantity for "Old Columbia," being an agricultural county.

The mechanic arts were very limited, probably for the reason that little inducement has heretofore been offered by the society to call out the handy work of our mechanics.

In household products the show was far superior to any heretofore in the

county, but much short of what it deserves to be. This useful and noble department has also been unfortunate in being overlooked, and much time and labor consumed in preparing some light fancy article for show, instead of something tangible and durable.

In the fancy department there were 384 entries, comprising many beautiful specimens of paintings, needle-work, &c., showing clearly that the ladies, during the year had not been idle. This part of the exhibition was far superior to any ever before held in the county, and the society hopes by offering still greater inducement, to turn their attention to useful employment, to labor, and place it where it belongs, the first in the rank of usefulness and importance.

The exhibition on the last day of the fair terminated rather abruptly in consequence of a pouring rain which prevented carrying out the programme for that day, and sent many hundreds home before entering the grounds. Still, notwithstanding the severe storm which continued all day, there were about one thousand present, as many as could be accommodated in the building to listen to the address, delivered by Francis Silvester, Esq., who very eloquently and ably entertained the audience, discussing the independence of the farmer, his usefulness and the honor of his occupation, and cite many instances of our greatest men whose chief delight and highest aim seemed to be, to own and cultivate the soil.

JAMES G. VAN VOLKENBURGH, *Pres't.*

Finances.	*Cr.*
Balance in treasury from 1857,	$445 73
Received from annual members, admission tickets and stand rents,	1,882 97
Received from life members,	105 00
" donations and other sources,	382 69
	$2,816 39

	Dr.
To amount of premiums and expense paid of 1857,	$139 15
" principal and interest on debt of society,	1,130 26
" expense of annual fair,	298 12
" expense to grounds, building, &c.,	345 81
" premiums and damage for 1858,	663 50
	$2,576 84
Leaving balance in treasury,	239 55

Officers for 1859.—President, Peter F. Mesick, of Ghent; Secretary, H. D. Ford, Chatham Four Corners; Treasurer, H. R. Coburn, Chatham Four Corners.

JAMES T. SHUFELT, *Treasurer.*

CORTLAND.

The Cortland County Agricultural Society held its twentieth annual fair on the 21st, 22d and 23d days of September.

Since the last annual report the society has purchased about fifteen acres of land, midway between the villages of Cortland and Homer, perminently enclosed it, and fitted it up as a fair ground. It is nearly a dead level; the soil is firm and gravelly, so that it poaches but little even after long rains; it is easy of access in all directions; it commands beautiful rural views on every side in the very heart of our county, and taken altogether, we feel confident that it can be surpassed by no other ground devoted to the same object in the State. The track for the exhibition of horses is just half a mile long, thirty-three feet wide, and is graded with the utmost accuracy.

The buildings this year were commodious, though but temporary. Permanent ones, corresponding with the ground, are to be erected before the next fair.

The fair of 1858 opened inauspiciously in rainy weather, but the constant arrival of articles for exhibition, and the thronging crowd, soon proved that no such hindrances were sufficient to keep our farming population from their favorite annual festival. The show of stock was good in nearly every department. The display of agricultural instruments, and mechanical products generally, was fine. Among the articles not on the regular exhibition list which were presented was a very choice collection of specimens in natural history, particularly in animals and birds; it is proper to say, they were prepared by a young man of this county, who has taken this method to render useful an industry which could not be rendered applicable to common labor. We hope hereafter to see this class of exhibitions extended to entomology, particularly in that department of insects which are injurious to vegetation. If taught to know our foes we shall be better prepared to institute experiments for destroying them, or driving them from our fields. Of the floral department of our fair, under the arrangement of the ladies of the society, it is sufficient to say, that it maintained its previous reputation. About eight hundred dollars in all were paid out in premiums, and it is not, perhaps, too much to say, that not a dollar of it went to an unworthy or second hand article.

The annual address was delivered by Hon. Nathan Bristol, of Waverly, Tioga county; though it occupied nearly two hours in the delivery, it was listened to with marked attention, owing to the sound, practical, and often original views of the speaker, and his graceful delivery.

Without going into further details, I am happy to report that every measure and arrangement of the society, for the past year, has been highly successful, and that every thing promises prosperity in future.

The annual report of the treasurer is subjoined.

The following is the list of officers for 1859: Manly Hobart, of Homer, President; Henry B. Burr, of Homer, Secretary; Morgan L. Webb, of

Cortlandville, Treasurer, and there is an executive committee of twelve from the different towns of the county.

STEPHEN D. FREER, *President.*

TREASURER'S REPORT.

Balance in treasury of last year's account,		$1,004 51
Amount received at annual fair,		1,541 99
Amount received of 100 life members,		1,000 00
Amount received for hay sold on fair ground,		90 00
Amount received from State Treasurer,		75 00
Amount received from Horace White (special premium),		25 00
Total,		$3,736 50
Amount paid on purchase of land,	$590 00	
Amount paid for fencing, building, roads, &c.,	1,257 94	
Amount paid premiums and expenses,	732 54	
		$2,580 48
Balance in hands,		$1,156 02

MORGAN L. WEBB,

Treasurer Cortland County Agricultural Society.

CORTLANDVILLE, *January*, 1859.

DELAWARE.

Delaware county was organized in 1797 with an area of some 871,686 acres of land, something over one-half of which is now under improvement. It is situated between 41 degrees 50 minutes, and 42 degrees 30 minutes north latitude and 1 degree 28 minutes, and 2 degrees 29 minutes east longitude. Its whole surface is elevated, ranging from ten hundred to twenty-five hundred feet above the level of tide water. Its surface is rough and corrugated, rising from low hills to lofty and precipitous mountains, interlaced with numerous mountain streams and river valleys. The county is drained by the Popacton and Mohawk branches of the Delaware river, the Charlotte and Ouliout creeks, with their tributaries. These rivers divide and separate these mountains, and form the three general mountain ranges that cross the county from southwest to northeast. The soil on the uplands, in the south and eastern parts of the county, is a brownish clay loam, with rock embracing various species of secondary gray wacke, while portions of the north and west have a red soil, and the rock pertaining to the old red sand-stone and slate. The whole of the uplands are underlaid with a very hard and tenacious hard pan of slate clay, from two feet to six inches below the surface. In the valleys the soil is usually loam, or clay loam, sand and gravel, resting on a bed of sand, gravel, and cobble stone, which renders it exceedingly liable to leach. The soil was originally covered with a dense forest of beech and maple, interspersed with birch, baswood, elm, cherry, and ash, white oak, chestnut and hickory on the high grounds, in some localities, while hemlock and pine abounded along the rivers and creeks

and adjacent hills. In the early history of the county lumber was its staple, and the energies and capital of a large portion of its inhabitants were invested in its manufacture, and agriculture was considered as of only secondary consideration, and those that followed it labored to produce only such commodities as were marketable in a lumbering community. Lumbermen were, directly or indirectly, the purchasers of nearly all the products of the farm, but they could pay for them only as they were favored with freshets to get their lumber to market; these freshets occurring the most frequently in the spring, caused them to make their bills payable at that season of the year, they being the purchasers, and doing business on credit, produced, almost of necessity, a system of long credit, the effect of which was, the merchants were compelled to make their purchases in New York on a year's credit, the farmer had to buy on credit at the stores, and in the fall and winter he had to dispose of all his surplus grain, pork, and hay, to the merchant, to settle his year's bill at the store. This allowed the merchant to stand as a sort of broker between the farmer and the lumbermen, and to fix his own prices on either hand; he could fix the price of the farmer's produce, because the farmer was his debtor and his bills must be paid, his produce could be sold only on time, without a sacrifice, and money before spring was out of the question. He could control the price with the lumbermen, because he must have the grain, pork, and hay, and goods, and he must have them on credit till spring, consequently he must buy where he had credit; this compelled him to buy his produce and goods at prices dictated to him. In this manner the products of the farm was passed into the hands of the merchant, for goods, and by him to the lumbermen for cash in the spring. This system of things continued till the country has been divested of its pine and other valuable timber, and is still continued to a limited degree in some parts of the county, and without adding anything to the property value of the county, or to those engaged in it, except an occasional individual that possesses the skill of making other people's labor conducive to their gain. But as the lumber began to fail, attention was gradually turned, more and more, to the cultivation of the soil, and an increase of the products of the farm, but it not being naturally a grain growing county, the farmers soon began to seek for more profitable returns for their labor, and gradually changed to the raising of stock, which paid better than grain, but, after a few years, it was found that wool paid better than cattle, and, for a time, the farmers went into the wool growing business, and, for a number of years, was one of the largest wool growing counties in the State, and from sheep and wool it again changed to dairy, and has continued to increase, in the quantity and quality of its butter, by constant gradation, until it now stands unrivaled in quantity, and not inferior in quality, to any county in the State. While much of it is sold at home, and exported to foreign markets, under the borrowed name of Goshen butter. A name which has long since ceased to mean that it was actually manufactured in Goshen, or in Orange county, but refers simply to the quality of the article, let it be manafactured where it

may. It is computed that something over four millions pounds of butter is now made, annually, in this county, which yields a fair profit for the hard labor that its manufacture requires. And farmers, as a class, are yearly increasing their property, and not a few of them, in every town, are becoming wealthy.

Very little cheese is manufactured for market in this county. But while the county has advanced till it has become an extensive dairy county, it has not fallen back or retrograded as a grain growing district. Its soil and climate is naturally adapted to the growth of rye, oats and potatoes; and it is not very unusual for rye to reach twenty-five to thirty-five bushels to the acre, and oats from forty to sixty. Potatoes were formely produced in large quantities, and often ranged as high as three hundred to four hundred bushels to the acre. The first premium of the Agricultural Society of this county was awarded to a crop of four hundred and twenty-seven bushels to the acre, the largest crop that has been offered for premium; and the second premium was given the same year to a crop of four hundred and two bushels on one acre. But since the commencement of the potato rot, much less attention has been paid to the cultivation of this crop, and it is now not often that a measure of two hundred bushels can be reached per acre. Turnips, carrots and beets are being extensively raised, and every year is adding to the area of their cultivation, and their estimated value for feed. Manure is much more carefully husbanded and applied than formerly, by the best farmers. The manure is very generally applied in the spring to the corn and root crops, which renders the soil in fine condition for wheat, some very fine crops of which in this way are raised, though the soil is not naturally adapted to that kind of grain, it being a soft water, hard pan soil, and possessing no lime or lime quality in its formation in any part of the county. Corn is not as extensively raised in this as in some of the other counties of the State, and more on the silicious and gravelly low grounds than on the hills, but some very good crops are raised in both localities. This crop ranges from forty to sixty bushels to the acre, though in many instances it attains to much higher figures. On the sand and gravelly flats that are porous and leachy, the manure is usually applied in the hill, but, on the uplands, is more generally spread broadcast and plowed or harrowed in. Turnips and carrots succeed in this soil, and crops of from 600 to 1,000 of the former, and 500 to 800 bushels of the latter have been raised, and their value to the dairyman and stock grower is increasing, and their cultivation is felt to be of more and more importance as their cultivation increases.

There is much more spring than winter wheat raised in the county. The spring varieties now generally sown are Fife or Goldendrop and China Pearl. The crop of wheat that took the first premium this season at the winter meeting of the County Society, was eighty-five and a half bushels of good wheat on two acres and ninety rods of ground, raised by J. S. Munson, of Davenport, in this county. There were five other competitors for premiums on wheat, with crops ranging from twenty to thirty bushels to the acre.

The dairy business is attracting much of the attention and capital of the farmer, and butter is now the grand staple of the county, with an average of over one hundred pounds to every man, woman and child in the county. Its sale, for the last ten years, has ranged from twenty to thirty cents a pound in market, and the usual product is from 100 to 150 pounds to the cow, varying according to feed and attention. The County Agricultural Society awarded its first premium, for the greatest net profit from a dairy of not less than eight cows, to Levi Hanford and Hiram Olmstead, of Walton, on a dairy of fifteen cows, which produced 2,954 pounds of butter for market, and yielded a profit from butter, and pork from dairy slops, of $780, for labor over expenses, or $52 to a cow. To this dairy was awarded a silver medal by the State Society. The County Society also awarded to Edward Hoyt, of Walton, its first premium for the greatest net profit from a dairy of less than eight cows, being a net profit from all sources for labor over and above expenses, of $259.95, or $48.74 to the cow, with an average of 166 pounds of butter to each cow.

The general elevation precludes this county from being a natural fruit growing county; but still some very good fruit is cultivated. Apples succeed well, and considerable attention is now paid to grafting and the propagation of good fruit, while some attention is needed in selecting varieties adapted to soil and climate. Pears can be profitably grown, though a general neglect of their culture is too apparent, though a few past years have witnessed a marked improvement by many. The plum was once almost as natural to the soil as its primeval forests, but for many years it has been almost exterminated by the effect of the black knot; but this scourge appears gradually giving way, and that fruit is again being propagated to a limited extent. Cherries are subject to the same disease, except in some varieties, but are scarcely as prolific as in some other localities. Peaches will hardly withstand the severity of this elevated climate, and where they are grown, they are of inferior quality—hardly worth the raising. Grapes do not succeed, except some of the hardy early varieties of the native kinds, and little attention has as yet been given to them. The smaller fruits and berries are found in their wild state in abundance, which has hitherto prevented the bestowal of much attention to the cultivated kinds.

The Agricultural Society of this county was organized in July, 1841, with a small membership, and has sustained itself to the present time, and has never failed of being entitled to, and of receiving the appropriations of money from the State, which the law distributes to the several counties, and for a number of years after its organization, it increased in numbers and interest, until its usefulness began to be felt, and its fairs to make a very respectable show. But the annual meetings, and the fairs being held at Delhi, the farmers, after the novelty of the thing began to pass away, soon began to tire of driving their cattle, sheep and swine, every year, from distant parts of the county to Delhi; consequently the interest of the shows began to decline. Delhi having the fair held there yearly, soon wearied of its presence, and began to feel annoyed with its visits, and the

small amount of premiums that could be offered, soon caused the society to decline in numbers, usefulness and means, until the annual fairs called but few together, and it was found necessary that measures should be taken to revive the interest, and extend its usefulness, or it would entirely fail. Efforts were made to awaken interest, lectures and public meetings were held in different towns, and the fair given to the town that would fence and fit up the grounds, and pay the greatest amount into the treasury. This caused a spirited rivalry and competition among the towns, and the first season of the change, the fair grounds were fenced and fitted up and $200 paid into the treasury. At this fair a much larger attendance assembled, and a better show was had, than the society had before witnessed in its most prosperous days. The same practice is still continued, and with very flattering results, and for the last five or six years the society has been steadily and rapidly advancing in numbers, means and usefulness, till at the last fair there were 134 horses entered for premium, 220 cattle, 50 sheep, 11 swine, 6 entries of poultry, 53 of manufactured articles, 8 of dairies, 34 of sugar and molasses, 127 of fruit and vegetables, 35 of miscellaneous articles, 210 in the ladies' department, and 64 in the boys'. And a premium list of near $1,000 awarded.

The treasurer's report shows:

Cash on hand at date of last report,	$452 97
Received from citizens of Franklin,	125 00
Received from State,	106 00
Received from all other sources,	894 72
	$1,578 69
To pay expenses since last report,	$303 15
To pay premiums,	921 13
Cash on hand,	354 41
	$1,578 69

Officers for 1859.—Col. S. F. Miller, Franklin, President; Z. H. Sloat, Meredith, Corresponding Secretary; C. B. Wade, Walton, Recording Secretary; H. Olmstead, Walton, Treasurer; Vice Presidents—Wm. B. Dowie, Andes; Porter Frisbee, Meredith; E. Roe, Sidney; T. S. Hoyt, Walton; E. R. Hopkins, Franklin; J. B. Yendes, Delhi.

WM. B. HANFORD.

WALTON, *February*, 1859.

DUTCHESS COUNTY.

This society has been in successful operation for eighteen years. From the beginning it received the support of many of the most intelligent farmers of the county, and from then till now, it has been steadily growing more and more popular. The operations of the present year have been

particularly successful. I am happy to say that several improvements have been made in its management, that promise material benefits. The society has for several years been in the possession of grounds and buildings for the purpose of holding its annual fairs, the expense of which was borne by the voluntary contributions of a few most interested in the welfare of the society. Ample as they seemed at the time of erecting the buildings, it has been found that they are insufficient for the accommodation of the many exhibitors that attended the fairs. The want of sheds for sheltering stock was very apparent, and during the past season subscription lists were put in circulation, the friends of the society again responded generously, and in a few weeks sheds enough to shelter all the cattle and sheep on exhibition, were erected. It is with pleasure that I further state, that all the expenses thus incurred have been paid, and the society is now free from debt.

Our hall, eighty feet by fifty, has been found too small, and soon the friends of the society will be again called upon to enlarge it, and as certainly will they I think cheerfully again respond. Another new feature in the transactions of the society, was holding the annual exhibition three days instead of two, as heretofore. This change gave general satisfaction, as it not only made the exhibition itself more interesting, but brought more money into the treasury.

Of the show I will give you a few details. It was held at Washington Hollow on the 21st, 22d, and 23d days of September. The entries were as follows: Short Horns 17, entered for premiums, and a number entered for exhibition only, by the Hon. William Kelly, of Rhinebeck, and Samuel Thorne, of Thorndale—Devons 9, Ayrshires 2, Native and Cross Blood Cattle 42, Working Cattle 28 pairs, Fat Cattle 20, Horses 130, Swine 27, Long Wool Sheep 75, Middle Wool 48, Merino 24, Silesean Merinos 14, Saxony 24, Cross Blood and Common 36, Chinese Sheep 1 buck and 1 ewe, with three lambs, Fat Sheep 16, Dairy, Butter and Cheese 12, Poultry 78, Agricultural Implements 51. In addition to these were the articles shown at the hall, the number of which I cannot give, for they were too numerous to mention here. There were vegetables, grain, fruit, flowers, manufactured articles, needle-work, paintings, drawings, works of art and skill in such abundance as to make a display never before excelled by any former exhibition of the Society.

I will not attempt any lengthened comments upon the quality of the animals exhibited, but will venture the assertion that they were, upon the whole, superior to those of any former year, and this opinion is founded upon personal observations made at nearly all the fairs of the society. I cannot, however, omit alluding more particularly to a few of the classes, and to those most active in their improvement. The breeding of short horns is receiving much attention in this county, and the animals exhibited at the late show, although not numerous, proved by their surpassing beauty that it has been done successfully. Prominent among those thus engaged is Samuel Thorne, of Thornedale, but his herd is of too wide celebrity to

need a notice from me. He exhibited a few of his choicest animals upon this occasion, and among them was that paragon of size, beauty, strength and docility, "Grand Turk." Nothing upon the ground received more attention than this noble animal, as he walked majestically among the admiring crowd with his three thousand pounds of bones, flesh and muscle. The Hon. William Kelley, of Rhinebeck, is also engaged extensively in this branch of improvement. He exhibited some of his best animals upon this occasion. They received what they deserved—much notice for their many points of excellence. These gentlemen generously declined to receive the premiums to which they were entitled in this class. Among others thus engaged I will mention the names of Daniel B. Haight, of Washington; Samuel T. Taber, Dover; A. M. Underhill, Clinton; R. G. Coffin, Washington; Wm. B. Dinsmore, of Rhinebeck. These gentlemen have been regular exhibitors at the fairs of the society, and the animals shown by them fully attest their skill and enterprise in this part of their occupation.

Much attention is at this time given to raising and improving of horses. The number on exhibition was greater than at any previous fair.

There seems to be some difference of opinion as to what encouragement should be given to this branch, some claiming that premiums should be offered for speed, while others, fearing that such encouragement would tend to injure the usefulness of the society, firmly opposed it.

At present only moderate premiums are offered, and those for horses for all work. How it will eventually end I cannot say, but certainly it is that the inclination to see them go fast is gaining ground upon all classes. There was a fine exhibition of farm implements, a department that some years has been quite deficient. Without going farther into detail I will only add, that the show in every department was good, in many very good, and giving to the society the strongest encouragement for further efforts to make it useful. The weather was good, and the attendance larger than ever before, the people maintaining their interest until the close. On the afternoon of the last day the throng assembled to listen to the address of the Hon. John Thompson. I trust you will find a place for it where others may participate in the pleasure it afforded to those that were so fortunate as to hear it.

Officers for the year 1859.—President, Peter R. Sleight, Poughkeepsie; Treasurer, John G. Halsted, Clinton Corners; Secretary, George Sweet, Washington Hollow; Assistant Secretary, John U. Abel, Chestnut Ridge.

CONDITION OF THE TREASURY.

Received from the State,	$157 00
Received at the fair and for membership,	1,323 21
Total,	$1,480 21
Disbursements.	
For premiums and expenses at fair,	1,444 73
In hands of treasurer Dec. 25, 1858,	$35 48

GEO. SWEET, *Secretary.*

ESSEX.

ELIZABETHTOWN, *February 28th*, 1859.

B. P. JOHNSON, Esq.:

Dear sir—The officers of the Essex County Agricultural Society for 1859, are as follows:

Aaron B. Mack, Westport, President, re-elected; Oliver Abel, Jr., Elizabethtown, Secretary; W. W. Root, Elizabethtown, Treasurer, re-elected. Vice Presidents, Oliver Keese, Jr., Chesterfield; Harvey Spencer, Crown Point; Philip S. Baldwin, Essex; David Judd, Elizabethtown; B. M. Hodgekins, Elizabethtown; Monroe Hall, Jay; William H. Hull, Keene; James G. Livingston, Lewis; Thomas Miller, Minerva; George W. Goff, Mesiah; D. Cheney Chase, Newcomb; Daniel Ames, North Elba; John Potter, North Hudson; Nathaniel Goodspeed, St. Armand; William J. Hayward, Schroon; David Hayward, Willsboro'; Amos Hardy, Wilmington; Thomas Delano, Ticonderoga; Samuel S. Root, Westport; John L. Merriam, Lewis, Marshal.

Yours, respectfully, S. HAND.

FRANKLIN.

MALONE, *March 5th*, 1859.

B. P. JOHNSON, Esq.:

Dear sir—I received a note from you, stating that the Comptroller wished a list of officers of our Agricultural Society for ensuing year, which is as follows:

President, James G. Dickey, of Constable; Vice President, Thomas R. Kane, Burke; Secretary, Frank Parlin, Malone; Treasurer, Daniel N. Huntington; Directors to fill vacancy, Geo. N. Keeler, Malone, Wm. H. Hoit, Malone; Hiram Russell, Fort Covington; Directors that hold over from last year, Alexander Lindsay, Malone; Joseph Wilson, Bangor; Benjamin Harmon, Malone.

Yours truly, FRANK PARLIN,
Secretary Franklin Co. Ag. Society.

GREENE.

The Greene County Agricultural Society held its annual fair at Cairo, on the 29th and 30th days of September, 1858. The weather was fine, and the attendance large; never have there been so many people assembled together in the county of Greene on any other occasion. Previous fairs were all thrown into the shade by this universal out-turning of men, women and children, thus demonstrating that in agriculture, horticulture, domestic manufactures and mechanic arts in Greene county, curiosity is awakened, interest excited, competition is increasing. The success and prosperity of the Society in this county is regarded as a fixed fact. There is an increasing desire to take part in proceedings and operations of the Society, to feel at home in its meetings, and to share in the proud consciousness of doing something to promote its usefulness and the general good.

The fair grounds were enclosed with a fence, from seven to eight feet high. A large church was within the enclosed grounds, and occupied by the Society, which has two floors ; the upper one was filled with delicious fruits, beautiful bouquets of flowers, arranged with much taste and skill, fancy needle-work, various articles of domestic manufacture, paintings, &c., and many other things impossible to mention here. The lower one was filled to overflowing with the finest of vegetables, many fine samples of grain of all kinds, products of the dairy, &c.

Horses—Of the noble and favorite animal, the horse, the show was not only large, but embraced many animals of superior merit. The whole number of entries was 113, of which 15 were stallions, 20 matched horses, 13 single horses, 22 mares and colts, 5 trotting horses, 8 three-year old colts, 22 two-year old colts, and 8 one-year old colts.

Cattle.—A larger number than usual were exhibited, the general excellence of which reflect credit on their enterprising exhibitors. The whole number of entries was 138, of which 9 were bulls, 17 milch cows, 13 two-year old heifers, 13 one-year old heifers, 4 calves, 38 working oxen, 14 three-year old steers, 6 yearling steers, and 10 fat cattle.

Sheep.—Some very fine sheep of the fine and long wool varieties, were exhibited, and those especially that received the premiums well deserved the preference shown them, without disparagement to the truly fine sheep of the other exhibitors. We can here say that our county is adapted to the raising of sheep, and we would be glad to notice more interest than is manifested among the farmers of Greene in that direction.

Swine.—A larger number were exhibited than at any previous exhibition, and there is an evident improvement in this race of animals. Mr. Sayer, of Cairo, exhibited a new variety called the Derbyshire, imported by him from England, in the year 1857, which show some remarkable points in smallness of bone and aptitude to take on fat, which will make a valuable addition to our stock.

Poultry were exhibited in greater numbers than ever before and many choice specimens were shown.

Butter and Cheese.—The competition in butter and cheese was quite extensive. The samples on exhibition were creditable indeed and almost baffled the skill of the judges to discriminate which was entitled to the premiums.

The agricultural implements and productions from the mechanic shops were creditable ; improvements were noticed in this department.

The annual address was delivered on the second day of the fair by Hon. Horace Greeley, of New York ; it was listened to with unusual interest by a large audience. After the address the reports of committees were read and the premiums awarded.

Amount received during year, ... $540 68
Amount of cash paid, premiums, &c., ... 518 17

Forty-seven volumes Transactions State Society awarded ; forty volumes Transactions American Institute awarded ; twenty-four diplomas awarded,

and ten volumes of Youatt; Dodd's Modern Horse Doctor; Breck's Book of Flowers; Barry's Fruit Gardiner, &c.

The annual meeting was held at Cairo on the 3d day of January, 1859.

A premium of $6 was awarded to James P. Hawley, for the best acre of corn—88½ bushels, raised in the year 1857.

A premium of $6 was awarded to Nathaniel Ormsbee, for the best acre of corn—ninety bushels raised in the year 1858.

Mr. Hawley's statement: In presenting to you my claim as a competitor for the best acre of corn, I will state to you the condition of the soil, &c.: The soil is a clay loam; it was plowed in the fall; had been in grass twelve years; mowed two years, then pastured with sheep two years, and so on alternately until plowed. In the spring, May 19th, it was thoroughly cultivated and dragged, then marked out with a corn marker 3¼ feet each way, then one large spoonful of phosphate of lime put in each hill, four kernels of corn dropt on the same, of the eight rowed yellow corn, then covered the usual way; finished planting the 21st; hoed twice; the first time hoeing went through with a horse hoe; both ways the second time with one horse plow; plastered once between the hoeings; no other manure but phosphate of lime and plaster were used; no extra expense more than usual to corn when done well.

Mr. Ormsbee's statement: The acre of land measured as sworn to, lay in a body. The soil was a sandy loam in good condition, was green sward last year, plowed and planted with corn; the present crop was manured in the hill with a compost of hog and hen manure, plaster and ashes about equal parts, and about a pint was used to each hill; was planted about 20th of May, in rows three feet apart each way; about six quarts of King Phillip corn to the acre was used in planting; was cut up by the ground and stacked the latter part of October, and the amount of corn raised on said acre, the past season, was ninety bushels.

Officers of the Society for the year 1859.—President, Addison P. Jones; Vice-Presidents, Lewis Sherrill, Nathaniel Ormsbee, Benjamin Roe, Lucius Pond, James P. Hawley; Treasurer, Danforth K. Olney; Secretary, Horatio L. Day; Marshal, George Beach; and six directors.

The average crops, per acre, in this county, for the year 1858, as near as can be ascertained, are: winter wheat, twenty bushels; spring wheat, fifteen bushels; corn, forty bushels; rye, fifteen bushels; oats, thirty bushels; buckwheat, twenty bushels; potatoes, 150 bushels; beans, fifteen bushels, and hay 1½ tons per acre. A resolution was adopted at the annual meeting authorizing the board of managers to locate the fair for five years at one place, and to enclose several acres for the use of the society. We have no doubt but the society will derive great advantages from the adoption of this course, as the grounds occupied by the society the last two years were too small for its use.

All of which is respectfully submitted,

HORATIO L. DAY, *Secretary.*

HERKIMER.

FRANKFORT, *March* 17, 1859.

Dear Sir—The following are the officers of the Herkimer County Agricultural Society: President, Peter H. Warren; Vice-President, George W. Joslin; Secretary, James Folts; Treasurer, James W. Lewis. They were duly elected by the members of said society. I will see the treasurer and have him make his report in due time.

Respectfully yours,

JAMES FOLTS, *Secretary.*

JEFFERSON.

The annual meeting of the society was held on the 22d and 23d of September, and as a whole, is supposed to have exceeded in interest that of any former year, and the receipts from all sources are greater in amount. There were 977 entries of animals and articles for exhibition and competition. On the second day, the President, A. P. Sigourney, delivered the annual address, which was replete with practical instruction for the mass of agriculturists, who listened to it with marked attention. The society has purchased an addition of over four acres of land and enclosed it with their former grounds, making fourteen acres, and the buildings and erections are now ample for the accommodation of the society and exhibitors.

Hon. Calvin Littlefield, presented a very interesting report of the viewing committee which is annexed.

The annual meeting of the society was held on the 12th of January, 1859, when premiums were awarded.

Best and largest variety of apples, correctly labeled—W. Ives Watertown; best fifteen varieties—Benjamin Maxon Hounsfield; best acre winter wheat, thirty-five bushels per acre—R. Betton, Perch river; best crop spring wheat, twenty-six bushels and three pecks per acre—Job Sowle, Pamelia.

WINTER WHEAT.—STATEMENT OF ROBERT BELTON.

One and a half acres winter wheat, Soule's variety, raised by Robert Belton, in the summer of 1858, at Perch river, in Brownville, yielding fifty-two bushels, by measure, from the acre and a half. The land, a hill side; the soil, a clay; previous crops, spring crops; the last, spring wheat. Preparation of the ground for the above crops by summer fallowing: first plowing in June, depth about six inches. Two or three weeks after plowing the ground was thoroughly dragged over; the forepart of August cross plowed, after which some portions of the piece slightly manured with common barn-yard manure, spread over the ground; sowed the last week in August; quantity, two bushels to the acre; cultivated in with the cultivator, and afterwards dragged over; harvested the last of July, and secured from the acre and a half fifty-two bushels of good clean wheat, a part of which was sold for seed.

Value of crop,		$91 00
Cost of cultivation in plowing,	$4 00	
Seed,	6 00	
Cultivating, &c.,	2 00	
Interest,	3 50	
		15 50
Nett,		$75 50

I certify the foregoing statement to be true.

ROBERT BELTON.

January 12, 1859.

SPRING WHEAT.—JOB SOWLE.

The cultivation of a crop of wheat grown in Pamelia in 1858: The land was plowed in September, 1857; plowed again in May; sowed on the furrow; dragged twice and rolled; soil mellow; variety, clay marl; no manure was used; previous crop, barley; quantity of seed, a little less than two bushels per acre; the wheat was Fife, or Scotch variety; the land measured three acres and ninety rods (3 90-160); the amount raised was ninety-three bushels and thirty-two pounds (93 32-60), or a trifle over twenty-six bushels and three pecks per acre.

The cost of raising the above crop was as follows:

Plowing twice, 10s., three acres and ninety rods,	$9 00	
Seed, seven bushels, 8s. per bushel,	8 00	
Harrowing and rolling,	2 00	
Harvesting, 16s. per acre,	7 00	
Sowing, 4s.,	50	
Interest on land, with taxes,	11 00	
		$36 50
The straw pays for thrashing.		
Cr.—By ninety-three and 32-60 bushels wheat at 8s. 6d.		99 36
Leaving a net profit of,		$62 86

I hereby certify that the above statement is true,

JOB SOWLE.

OATS.—JOHN N. VAN AMBER.

Statement of a crop of oats raised by John N. Van Amber, in the town of Pamelia, 1858: Land previous year manured on sod, with about ten loads coarse manure per acre, and plowed and sowed to barley. This year plowed early, and sowed with oats on the 3d day of May, at the rate of three bushels per acre, and harrowed in. Crop after harvesting and thrashing with a machine measured 166 bushels, and weighed 36 pounds to the bushel; was raised on 308 rods of ground, measured with a tape line.

Value of crop,		$83 00
Cost of cultivation:		
Plowing,	$2 50	
Seed,	2 25	
Harvesting,	3 00	
Thrashing,	4 98	

Interest,	$0 84	
Sowing and harrowing,	1 00	
		$14 57
Net proceeds,		$68 43

JOHN N. VAN AMBER.

OATS.—NATHAN FRANCIS.

Statement of crop of oats raised by Nathan Francis, in the town of Champion, this season: The crop of oats presented for a premium was grown on one acre of land, accurately measured. The soil is sandy loam. The previous crop was potatoes. The ground was manured with twelve loads per acre; plowed the 28th of April, 1858, and sowed on the 4th day of May with three bushels, and harrowed in. Thrashed with a machine, well cleaned, and measured fifty-five bushels, worth at the time $20.62 The grain presented is a fair sample of the whole crop.

Value of crop,		$20 62
To plowing and harrowing,	$2 50	
Value of manure and drawing the same,	4 50	
Seed and sowing,	1 38	
Harvesting, thrashing, cleaning,	3 20	
Interest and taxes,	2 92	
		14 50
Net profits,		$6 12

CORN.—C. S. GAGE.

Statement of a crop of corn raised in the town of Rodman, by C. S. Gage, in 1858: The crop of corn presented for a premium was grown on two acres of land, accurately measured; the soil is gravel; the previous crop was corn. The ground was manured with twenty-five loads of manure per acre; plowed and planted on the 27th day of May. When thrashed and well cleaned, the corn measured 120 bushels, worth at that time $90. The grain presented is a fair sample of the whole crop.

Value of crop,		$90 00
To plowing and harrowing,	$4 00	
Value of manure, seed and planting,	12 00	
Harvesting, thrashing, cleaning,	12 00	
Interest and taxes,	8 00	
		36 00
Net profits,		$54 00

CARROTS—QUARTER OF AN ACRE.—W. W. GREENE.

Statement of carrot crop raised by W. W. Greene, Watertown, 1858, on one-fourth of an acre of land: The soil loamy, clay or loam, with clay subsoil; previous crop, parsnips; no manure used. The carrot seed was sown the 15th of May, and harvested on the 25th, 26th and 27th of October, and marketed the three following days, and the crop measured 280 bushels.

Cost of crop :	
Plowing and dragging, &c.,	$0 50
Sowing,	50
Seed, ½ lb.,	50
Hoeing, weeding,	6 00
Harvesting,	9 00
Marketing,	4 00
Interest on land,	1 75
	$22 25
Cr.—280 bushels at 20 cents per bushel,	56 00
Leaving credit balance,	$33 75

CARROTS—QUARTER OF AN ACRE.—N. C. SIKES.

Statement of crop of carrots raised by N. C. Sikes, of Watertown, this season: The seed was sown the 8th of May; quantity sown was one pound per quarter of an acre, from which was harvested 270 bushels.

Expense of tilling and harvesting,	$25 00
Value of 270 bushels of carrots, at 25 cents per bushel,	67 50
Net profits,	$42 50

For a sample of winter-made butter, a premium to Daniel Parker, Watertown, ... Diploma and $2 00

STATEMENT MAKING BUTTER.

The butter in this jar I offer for inspection was made from about 14 cows, from 10th to 25th December, just one month after the cows were stabled and fed on dry feed. Six of the cows gave most of the milk, and they were fed on timothy and white clover hay, cut early and in good order. The rest of the cows were fed on early cut oat and barley straw. There was no coloring added in any way to this butter. The cows were milked in the stable by careful milkers, which I consider an important item in making butter in the winter; after which the milk is strained into a large tin pail, expressly for the purpose, and set into a tin vessel with boiling water on the stove. Care must be taken to have the milk in hot water until thoroughly heated. I consider it of no use to half heat the milk. When well heated, there will a scum rise on top that should be taken off before setting in pans. The milk is set in the buttery, the door of which is left open to the adjoining room, where a steady fire is kept throughout the day and evening, to prevent the milk getting cold or blue, as in our opinion it is impossible to make good butter from chilled milk. Milk should stand about four days in the winter, in order to get all the cream. The cream stands in an open vessel in the buttery, unless the weather be cold, when it may be set near the stove from two to four hours before churning, care being taken to stir the cream well every day, and always churn at least twice a week, no matter how small the churning. Our butter is churned in a dash churn, and never takes to

exceed half an hour in the winter. If the cream, after churning a little while, gets stiff or too hard, we add a little sweet milk. The butter is washed in two waters, and salted with Ashton salt.

DANIEL PARKER.

WATERTOWN, *January 12th*, 1859.

Balance in treasury, January 1858,	$596 02
Receipts during year and at annual meeting,	1,952 89
	$2,548 91
Expenditures, (of which for premiums $1,037.50,)	2,350 16
Balance on hand,	$198 75

Officers elected.—Clift Eames, President, Rutland; A. P. Sigourney, Secretary, Watertown; E. S. Lansing, Treasurer, Watertown; First Vice-President, Hon. William Rouse, Clayton; Second Vice-President, James Parker, Watertown; Third Vice-President, Virgil C. Warriner, Ellisburgh; Director in 1st Assembly District, E. G. Cook, Ellisburgh; Director in 3d Assembly District, George Webb, Pamelia; Board of Auditors—T. H. Camp, Watertown, E. S. Massey, Watertown, John A. Sherman, Watertown.

REPORT OF THE VIEWING COMMITTEE.

Mr. President—The viewing committee respectfully submit the following report:

They have examined four farms, seven cheese dairies, seven butter dairies, two kitchen gardens, and two nurseries.

It has been their good fortune to traverse a large portion of the county in discharging their pleasant duties. Generally the spirit of improvement is active. The neglected corners are less in size and fewer in number, the fields exhibit more careful culture, and tasteful and convenient dwellings are succeeding the old brown houses, shattered by the storms of many years. Some premises are, however, ornamented with scattered lumber and worn-out implements, and the whole gracefully surrounded by a stalwart growth of noxious weeds, that fall uncropped to the ground. The economy and taste of this habit is apparent—for all the rubbish not suitable to the compost heap may be easily reduced to ashes, a valuable fertilizer.

The present season has been favorable. The rain was timely to avert the scourge of the drouth and the grasshoppers. Spring grain suffered from excessive rain early, and too little as the season advanced. Each of these extremes forcibly suggest the use of the tile drain. The hay crop was good, potatoes are fair, corn looks well, the dairy yield is large, and even with a scarcity of fruit in the county, 1858 will compare favorably with former years.

Competition has not been spirited, especially on farms. Many of the enterprising farmers are in the midst of thorough and radical improvement. Their ideal of a model farm is not yet realized, and they seem unwilling to

submit their work with so many outlines unfinished. In no instance did competitors fail to mention projected improvements, with as much interest as they referred to those already made. With such honest and intelligent exhibitors the standard of excellence would do credit to any locality.

The word finished is nowhere to be found in their vocabulary—progress everywhere. In most cases the work has been so complete that a casual observer could define its limits, and tell what came next in order. Where rocks had been rent and marshaled in long lines of comely and substantial wall, making an arable field, other lots awaited the tile and the sub-soil plow, the tidy dwelling and ample yard needed trees and flowers, and the kitchen garden was destitute of many of its richest treasures. Again, where all these united in the most perfect realization of a rural home, other material works found willing hands, and busy, intelligent minds wrote on stock, and field, and garden—"to be surpassed."

The wisdom of other committees who have withheld the first premium is not questioned. A model farm does not come up like an exhalation. The high price of labor and fertilizers makes it the work of time. This year the prize is tendered the "best offered in competition," and the awards are made, not as the farms reach, but as they approximate the following standard:

A good soil, the moist land underdrained, the poorer manured, and the whole made to produce an uniform excellent crop, free from foul weeds. Barnes and stables adequate to store the produce and house the stock, the yard sheltered and supplied with water, and arranged to preserve the manure, the lots suitably fenced, the stock of the best blood, well-kept and thriving. The dwelling fashioned for comfort and convenience, a good supply of pure soft water, a bath-room, an ice-house, ash-house, and other suitable buildings, and a door-yard, ample, and tastefully arranged with trees and flowers. A kitchen-garden, with all the "vegetables of the season," also the strawberry, raspberry, gooseberry, blackberry, plums, cherries, grapes and pears. The orchard thrifty and prolific with apples maturing every month from July to May.

When these stereotyped points are met, at no distant day, other committees will designate better models and make greater exactions.

John M. Waterbury, Hounsfield.—Farm of 104½ acres, improved 83, meadow 15, pasture 23, under plow 45, woodland 2½—number of lots 13; limestone wall 4½ feet high, cost per rod $1, 378 rods; cedar fence, staked and capped, 7 rails high, cost 65 cents per rod, 394 rods; black ash, 7 rails high, staked and capped, 50 cents per rod, 218 rods; basswood, 7 rails high, staked and capped, 20 cents per rod, 190 rods; board fence, 23 rods at $3 per rod; cedar posts and spruce bars, 24 rods, at $5 per rod. Soil is loam, clay and muck; plow 9 inches deep; do not use subsoil plow; manure at the time of plowing for corn and wheat; average per acre, wheat, 24 to 27 bushels, barley 30 to 35 bushels, oats 35 bushels, corn 50 to 60 bushels, peas 30 bushels, potatoes 175 to 200 bushels, hay 1½ tons per acre; plow in spring for spring grain; woodland fenced; house 32x36

feet, with wing 37x23 feet; cistern and well; barn 40x33 feet, horse-barn 24x30 feet, shed 50x20 feet, shed 50x22 feet, corn and hog-house 24x22; cattle are supplied with water from cistern in the yard in winter; dwelling painted white, cost $75; horse-barn painted red, cost $25; farming utensils housed when not in use; orchard five acres, 20 trees cultivated, balance natural; Seek-no-further, Fall Pippin, Rhode Island Greening, Sweet Russet, Pound Sweet, Swaar, Spitzenberg, Gillflower; kitchen-garden, ¼ acre—fruit, peach, plum, cherry, white and red currant, black raspberry and Isabella grape; few thistles or weeds; ornamental trees—pine, red and yellow cedar, tamarac, honey locust, common locust, sumac, varieties of roses, &c.; do not keep accurate farm account; net proceeds $400 per annum.

John T. Davenport, Leray.—Farm of 104 acres, improved 90, meadow 25, pasture 35, under plow 28; number of lots 9; rail (mostly black ash) fence staked and capped, 719 rods, cost 65 cents per rod; whole wall, 160 rods, cost $1.13 per rod; half-wall, 60 rods, cost 56 cents per rod; board fence 40 rods, cost $1 per rod; soil black muck, clay and gravel; subsoil clay; plow six to eight inches deep; don't use subsoil plow; manure plowland in spring, meadow in fall; grain per acre 25 bushels; hay 1½ tons per acre; raise carrots and feed cows in the fall to increase the quantity and quality of milk; plow in spring for spring crops; woodland not inclosed; have open and blind drains, in all 140 rods—they increase the quantity of hay and grain; open drain costs 30 cents per rod, blind drain costs 40 cents; dwelling, gray limestone, penciled; addition, wood, 25x40 feet; supplied with water from cistern; barn 32x32 feet, with linter 16x70 feet; spring in yard waters stock in winter; farming utensils are housed; dwelling painted white at a cost of $75; horse-barn painted brown, cost $10; orcharding 3 acres, natural and cultivated; kitchen-garden one-eighth acre—fruit, cherries, gooseberries, currants and raspberries; thistles in highway and pasture are mown every year; ornamental trees, maple, elm, mountain ash, butternut; cash receipts last year for farm produce, $1,074.60.

Rufus Peck, Ellisburgh.—Farm of 80 acres; improved 65, meadow 23, pasture 18, under plow 23; number of lots 9; cedar rail fence staked and capped 800 rods, cost 65 cents per rod; post and bar 40 rods, cost $1.25 per rod; picket 55 rods, $2 per rod; picket, painted, 8½ rods, $4.50 per rod; soil, black muck, sandy loam; sub-soil clay; plow 10 inches deep; don't use subsoil plow; stable manure is put on corn ground in spring, and on meadow land in summer or fall, after which drag and bush; hay 2½ tons per acre; barley 30 bush. per acre, corn 65, wheat 25; don't cultivate roots; plow always in spring for spring crops; woodland inclosed; open drain 100 rods; cost 25 cents per rod; has good effect on grass and grain; dwelling is 32x36 feet, wing 20x40 feet, including wood and cheese-house; water, 2 wells and 1 cistern; barn No. 1, 44x54 feet; No. 2, 58x28; No. 3, corn barn, 14x28 feet; stock supplied with water in winter by a spring, brought in lead pipes; tools kept housed; dwelling painted white, horse-barn brown, work-shop yellow —total cost $150; 4 acres orchard, nearly all cultivated; kitchen-garden

¼ acre,—grapes, plums, cherries, &c.; exterminate weeds on farm and in the highway; ornamental trees—maple, horse-chestnut, weeping willow, balsam, silver leaf maple, mountain ash, crab-apple, &c.; do not keep a farm account; the proceeds are laid out in improvements.

In cheese dairies the marked and uniform diversities show different methods of manufacture. A maturing to meet the time and place of manufacture is of prime importance, and it makes an absolute standard of excellence impossible. The committee prefer that best answering the following description: Rind firm, smooth, impervious; texture compact, like butter, and salted to season and preserve. The best dairy of this kind was that of our associate, Mr. Benjamin, and his mode of making is furnished for publication. We cordially approve of the plan of making a quality of cheese for a particular market, and the careful dairyman will merit the highest price by the uniformity of his product.

C. A. Benjamin, by request, furnished the following: Has 30 cows; set night's milk in tin vat inside wooden vat; takes off cream, does not return it; set at 84°; cut the curd fine with curd knife; separate whey by dipping through a linen strainer; scald (by putting water between vats) gradually to 108° for 1½ hours; salt, 5 oz. to 10 lbs. curd; put in press cold; press 24 hours; bandage after 8 or 9 hours; apply to surface in curing weak leys soon after taking out of press; the 2d day after applications of ley, use a little grease and rub once a day after turning.

Stephen Hodges, Watertown.—Has 50 cows; sets night milk in zinc vat; skims in morning, and strains in the cream with morning's milk; puts in rennet to bring the curd in three-fourths of an hour; cut the curd with a brass wire curd cutter; scald from 100° to 110° about one hour; separate the whey with a perforated tin strainer; use common salt, ½ oz. to 3 lbs. curd; press 24 hours; bandage when the cheese is turned; rennet preserved in stone jars in pickle; made last year 7½ tons cheese from 29 rennets; turn cheese once a day, and rub thoroughly; average this season 223 lbs. per cow.

H. C. Normander, Rutland—Has 40 cows; 100 acres pasture, 60 acres meadow, each seeded with timothy and clover; feeds no roots or grain; usual yield 450 lbs. per cow—280 thus far this season; night's milk set in tin vat, cream not returned; uses no thermometer; after cheese has come so as to cut smooth, curd is broken with wire cutter; when it settles, the whey is drawn off with tin strainer; scald by heating the whey and returning it; salt, 4 oz. to 10 lbs. curd; press 24 hours; bandage at 12 hours; whey fed to hogs; rennet is dried, packed in salt—when wanted for use is soaked in a pickle of salt, cinnamon and cloves.

D. E. Gibbs, Pamelia—Has 31 cows; 55 acres pasture, timothy and white clover; 40 acres meadow, timothy; feed grain in spring; average for the season, 400 lbs.; this season, 315 lbs. per cow; set in tin vat; return the cream; warm by heating part of the milk; set at 85°; keep ren-

net in pickle; scald one hour, hot whey at 110°; two oz. salt to 10 lbs. curd; press 24 hours; bandage at 12 hours; average weight, 85; color rind with annatto; feed whey to hogs; soil clay loam; keep dairy account; average income last year, $47.92 per cow.

D. C. Eddy, Pamelia—Has 26 cows; pasture and meadow, the usual kinds of grass; strains milk in tub at night; returns cream with morning's milk; set and scald by guess; press 24 hours as hard as possible; bandage when the cheese is turned; color the rind with annatto; turn once a day, and rub thoroughly with the hand; made this season per cow, 244 lbs.; whey fed to hogs.

In butter dairies the competition was close, and the preference given after the fullest consideration. Several of the lots were completely preserved, and the quality could not be easily excelled. All the requisites of a first class dairy had been observed, except it appeared to be too much worked, and the grain more or less injured. We suggest 60° as about the temperature for churning, and the introduction of cold water before the process is fully completed, to facilitate gathering. If the butter is sufficiently hard, once working is preferable, but often it is better to let it stand in a cool place for a few hours for the final working and packing. If the number of times working is material, as this is a mooted question, we wish makers to decide for themselves. At all events, avoid oily butter—preserve the grain.

As the "dairy question" has been so fully discussed by other committees, and as the President of the Society will, from his superior ability, do it ample justice in his address, we refer to that and the "statements" of makers, for important particulars.

C. S. Gage, Rodman—Has six cows; pastures 21 acres of red-top and white clover, hay of six acres, clover and timothy; feeds corn and barley meal in winter; scalds the meal fed in the spring; usual average, 200 lbs. per cow; sets milk in tin pans two-thirds full; it stands in pantry from 24 to 48 hours; cream is put in stone jars in the cellar; stirred two or three times a day; churn (Hersey's) three or four times a week; wash out the buttermilk; work with ladle, generally twice; use solar salt, ground, about one ounce to 16 or 18 ounces butter; pack in ash tubs soaked in brine; put a paste of salt on the top to exclude the air; keep it in the cellar; keep the tubs full of brine. Amount per cow last year, 206 lbs.; this year, to Aug. 31st, 133 lbs. Sour milk fed to hogs, calves, and the surplus to cows. Soil of farm, gravel and slate. Do not keep accurate dairy account. The income per cow last year was $38.

Wm. P. Buell, Rutland—Has 17 cows; usual varieties of grass and hay; feeds roots in spring. Annual average, about 175 lbs. per cow. Uses tin pans set in cellar; skims when the milk is thick; churns after 12 hours with dash churn; rinse in cold water; use Ashton salt, one pound to 20. Average this year to Aug. 20, 100 lbs.

Ira Brown, Rutland—Has 18 cows; 39 acres pasture seeded with timothy; 23 acres meadow, timothy and clover; feeds roots in spring; use tin

pans; sets in milk room fall and spring; in cellar in summer, 24 hours; cream is kept in tin coolers in the cellar, about 12 hours; stirred once; use dash churn; wash the butter till the water is clear; use butter-worker; work once; salt, (Ashton,) seven-eighths of an ounce to one pound; pack in tubs soaked in brine; put a cloth over the top; on the cloth one ounce of saltpeter, then a batter of salt; a stone is placed on the top that the cover may prevent the butter from rising as the brine is applied, and not come in contact with the butter; brine is added to early made butter. Average last year, 162 lbs. per cow, to Aug. 31; 116 lbs. this year. Sour milk fed to calves and hogs. Soil of farm, black muck and clay. Income last year, $30 per cow.

Abel Parker, Rodman—Has 11 cows; winter on hay; feed corn in spring; set milk in cellar; wash the butter; work once; salt, (Ashton,) seven-eighths of an ounce to one pound. Average last year, 155 lbs.; this year, 119 lbs. per cow.

D. W. Way, Rutland—Has 18 cows; pasture and meadow, timothy; feeds no grain or roots; works butter once. Average yield last year, 130 lbs. Made thus far this year, 90 lbs. Income per cow last year, $25.

J. P. Thompson, of Watertown, did not exhibit his butter dairy, but showed in the basement of his dwelling an extensive shallow zinc vat, in which milk in tin pans is set in warm weather, and cold spring water flows round the pans at the requisite height. The same valuable spring turns a water wheel for churning, sawing wood, &c.

The kitchen gardens examined by the committee, were excellent. The thrift and variety of their products, their neatness, the nice arrangement of flowers, mingling the useful and ornamental, constitute them desirable models, and the number of such should be largely increased. Judging from their works, most of the farmers are so remote from Eden that they have lost the skill and taste to "dress and keep a garden." We suggest, in all humility, that they begin to retrace their steps at the next convenient season.

The county is fortunate in the possession of two superior nurseries. Mr. Bosworth's was a model of good culture, and contains the "varieties of fruit trees and grapes proved hardy in this latitude." Mr. Becker has these; also a large variety of "ornamental trees, shrubs, vines, roses and green-house plants." The extensive vegetable garden attached, and building, in which Mr. B. is at present engaged, account for his not having all things in their usual good order.

Do not fail to visit our nurserymen. See how cheaply they enable you to raise the choice varieties of fruit. It will add greatly to the comfort of the household; for fruit, fresh, delicious, perennial, is a heritage of the "lords of the soil." Instruct the boys in horticulture. They will be stimulated, by its rich rewards, to plant new trees, rejuvenate the old, and make the summer a festival of delicious fruits.

Thus training up the sons, remember to take home a few choice flowers to the daughters. Give them a little of earth to till. Their work will add

new beauty to your home, their taste for colors will be improved, and in the healthful exercise they will require no "French Art of Dyeing" to make their ruby lips and rosy cheeks excel the fairest flowers.

Your committee are aware that no specific formula can make a good agriculturist. An aptness always distinguishes the successful. It may come from natural tact or experience. Usually both are requisite. Book-farming, without good sense, is not profitable; but it is a wonderful intuition that is able to learn nothing from others' experience. No disrespect is intended the pioneers in saying there is much in books to confirm and enlarge their scope of knowledge. With the axe and the brand they swept off the forest and possessed a prolific soil. Repeated crops have diminished the quantity, till the important work is to restore the exhausted elements, and recall the abundant harvests. For this science is needed, and a necessity becomes at once a source of profit and delight. Here, as everywhere, intelligence reaps the richest rewards. Were they placed in the reach of stolid toil, the mind could be dormant, and the ox become the peer of his owner. Hence knowledge commends itself to all farmers. They need to be "well read" as much as the "learned professions," and to meet this great want "Saxton's Agricultural Library" cannot be too highly prized. Besides this and sterling journals, they ought to *study* the elements of chemistry, botany, geology, entomology, and mineralogy, and make farming as correctly understood; it is a great experiment in the most interesting sciences. Mental activity, combined with experimental labor, produces the skill for abundant success, and an interest for the highest enjoyment. Such is Agriculture. As a calling, co-equal with humanity, God designed it to be the most happy. It is dignified above all others in the prophet's power to call forth bread for the famishing multitudes of consumers. It is beautified above all others in a round of duty, changing ever with the seasons, and symbolizing the sublimest mysteries in "that which thou sowest."

If we tread the mountain path with no eye for the grand; if we till the teeming earth with no soul for the beautiful, does it prove that neither beauty nor grandeur exist? Too practical for a farmer is the man who descries in the rainbow a neglected promise to pay, and beholds in the sunset and stars, gold dust and sparkling gems of no earthly use up there.

As a class we must not become too worldly—too material in our aspirations. Toil was ordained as a means, not an end of life. Whoever exalts it unduly, depresses humanity. It bows the stately form. It retards the elastic step. It stupifies the intellect. It deadens the sensibilities. The child takes its acrid poison with its first nourishment, and the old miser chews his last crust angered by its torture. There is nothing tolerable in the labor of the serf or slave. It sets its seal of degradation on the joyless countenance, and in the angular motion, and proclaims the triumph of matter over mind, of the body over the soul.

Building the railroad, introducing new implements, improving the stock, and sustaining our fairs, have made this one of the first counties in the State. It is too vigorously active to lose its prestige, and too generally

sensible to fail of the "higher life." Our homes will not be the last places irradiated, our families the last objects of intelligent care. Yet with all the progress of which we justly boast, has the endless drudgery of our wives and daughters been greatly diminished? Have they time to read the newspapers and the agricultural journals? Because they are unselfish and uncomplaining, it does not follow that they weary not, or have no thoughts above woman's work, which is never done. Lighten their daily tasks to pleasant duties, and then your fireside shall be the seat of intelligence and refinement, and your sons will be noble, your daughters accomplished.

There is a wide difference between the shallow forms of conventional life and the simple refinement of the true. The fashion and folly of the drones in town, are unsuited to the workers in the country. Social culture should not therefore be neglected. A day of severe toil may not induce the happiest moods for conversation, but the mind needs still more the stimulus of society. If physical exhaustion produces drowsy powers, the excitement of cheerful company makes repose pleasant and instructive. We need more frequent informal gatherings. Mind acts on mind, and the attrition quickens both. Elevated conversation, in which *men* and *women* participate, disseminates useful knowledge and exalts social life. New thoughts are mile posts of hopeful progress. We must furnish the city with material for merchant princes and professional ornaments. But let us keep the best at home. Root them there by trees they have planted; tie them by improvements they have made; bind them by the noble life that waits their living, and make them feel what all the world confesses, that a farmer's life is nearest heaven. With a due degree of mental, social, and moral culture, it is the happiest existence allotted to mortals. The poet sings its charms, the orator extols its beauty, the statesman sighs for its repose, and even the commercialist, with nothing he will not sell, (except his wife,) longs for *its banks*, surviving every panic, and declaring an "*annual* dividend" while the earth endures.

CALVIN LITTLEFIELD, *Chairman.*

LEWIS.

B. P. JOHNSON, *Secretary of State Agricultural Society:*

Dear Sir—In accordance with the requirements of the State Agricultural Society, I would respectfully submit the following report:

The last annual fair of the Lewis County Agricultural Society, was held at the village of Turin, on the 16th and 17th days of September last. The first day opened very unfavorable, the rain falling almost in torrents all day, which prevented the people from coming out, and the society was obliged to adjourn until the next day, which day opened much more favorable, and the farmers of Lewis, with their usual spirit of enterprise manifested on such occasions, turned out in large numbers, and the entries of all kinds, on that day, was much larger than on any previous occasion.

The show of cattle was very fine, some towns driving in their ten yoke of oxen in one string, attached to a cart well decorated with the different kinds of farming utensils used from the first settlement of the country up to the present time, showing the improvements which have been made in that part of the agricultural economy since, and also samples of most kinds of roots, fruit and grain, which the soil of Lewis is fully capable, with the proper culture, of producing, which added very much to the interest of the exhibition. There was also a good show of fine horses, and in fact, I may say the whole exhibition of cattle and horses, was such as the county may well feel proud of.

In the article of butter and cheese there were many competitors both in dairies and samples, and that being the principal product of our county, there seems to be a disposition manifested among our farmers to try and excel, and think that we may safely say that the butter and cheese manufactured in Lewis county is hardly second to any in the State, and with the same degree of enterprise now shown, the time is not far distant when we shall rank among the first. The first premium on dairies of cheese was awarded to Mr. Orson Clark, of Turin. The best dairy of butter to F. B. Rugg, of Leyden.

To the ladies we give much credit. Their department was full. The number of articles on exhibition was much larger than on former occasions, and many rare specimens of needle-work were shown, which called forth their full share of attraction, and added much to the show and enjoyment of all present.

Our mechanics were not to be outdone, their department being well filled with many fine specimens of mechanical art.

The third day the plowing match came off, which had its full share of contestants, showing some good specimens of plowing, and also, testing the great improvements in plows of the present age.

The equestrian exhibition next followed with a goodly number of competitors, which called forth a large share of attraction, and fully demonstrated that the ladies were not to be outdone by any, in the art of riding or driving.

The show of matched and single driving horses was good and the entries very large. The whole exhibition this year has been such as to give the friends of agriculture the most cheering prospects for the future success of their society in Lewis county.

The financial department of the society, I am happy to report to you, is in a prosperous condition. The receipts this year have been much larger than on former years, which has enabled them to discharge all of their indebtedness and the society now stands free from debt.

Dr. F. B. Hough, of Albany, delivered the annual address, which was very able and instructive, and listened to by a very large audience with a degree of interest and attention.

The annual meeting of the society, for the purpose of electing officers for the ensuing year, and awarding premiums on root and grain crops, was

held at the hotel of George House, in Houseville, on the 27th day of December 1858, at which time the following officers were elected, viz:

President, M. M. Smith, Lowville; Vice-Presdents, William Whittaker, Turin, Norman Gowdy, Martinsburgh; Secretary, C. M. Goff, Constableville; Corresponding Secretary, Johiel Whitemon, Watson; Treasurer, A. H. Lee, Turin; Executive Committee, Emory Allen, Constableville, Edwin Woolworth, Turin, John Tucker, Watson, Argo H. Buck, Denmark, Abert Foster, Martinsburgh.

All of which is respectfully submitted,

C. M. GOFF, *Secretary.*

LIVINGSTON.

Our annual exhibition for 1858 was held September 22, 23 and 24, embracing three days instead of two, as heretofore. The first day was devoted to the display of cattle, sheep and swine; the second to horses, machines and agricultural implements; and the third to the exhibition of dairy and family products, manufactured articles and fancy work, trotting horses, and ladies' and boys' riding match. There were exhibited 47 thorough bred Durham cattle, 245 grades, 314 sheep, 215 horses, mares and colts, and 27 swine, making in all 848 animals, and a large display of machines, implements, manufactured articles, butter, cheese, fruits, flowers and vegetables, which it would be tedious to enumerate.

The weather was somewhat unpropitious, particularly on the last day, when a rainy morning kept many people away, and tended materially to reduce the receipts of the society.

Livingston county is somewhat noted for fine cattle, and many of those shown as grades were in reality full bred Durhams, though not having an authenticated pedigree they could not be admitted in that class. The show of cattle on this occasion was a very fine one, including thorough breds and grades, fat cattle, working oxen and dairy cows.

The display of sheep was also a creditable one, confined principally to Merinos and Leicester, but including a few choice specimens of the Saxony breed.

Of swine the number was limited, and although among them were some superior animals, yet it must be owned that sufficient attention is not paid in this county to securing and keeping up the best and most profitable breeds.

The number of horses was large, and the show of mares, and colts of all ages, was good enough to satisfy any lover of this noble animal. In stallions and carriage and road horses the exhibition was not what it should be, nor as good as on some former occasions. The reason for it, as regards market horses, is probably found in the fact, that many of the finest of them find their way to eastern cities, at prices that would be considered somewhat extravagant in the country.

A fair variety of fruit was shown, and the samples of each kind were excellent, but the culture of the finer varieties is principally confined to comparatively few individuals. Here, certainly, is room for improvement in a region of country well situated as to soil and climate to the raising of almost all kinds of fruit.

The show of butter, both in quantity and quality, could hardly be excelled at any county exhibition. Cheese, except for home consumption, is not extensively manufactured here, but some of the specimens were worthy of commendation.

A premium of ten dollars was offered for the best loaf of wheat bread, with the recipe for making accompanying it, and the result was about one hundred and fifty loaves, among some of which it was difficult to choose. I append the successful recipe, the bread made from which was certainly delicious, whether by virtue of the recipe itself, which seems simple enough, or the skill of the maker, I am unable to say. The making of really good bread is far from being as universal a practice as it ought to be.

To a pint of new milk add a pint of hot water, stir in sifted flour to make a stiff sponge, adding a teacup of yeast; let it rise over night, or a sufficient time to become quite light without much heat, then mix and knead until it will not stick to the pan. Let it rise again, then make carefully into loaves without kneading. Let it stand in a warm place fifteen or twenty minutes, and then bake three quarters of an hour.

Since the last report we have expended about one thousand dollars in buildings and repairs upon the fair grounds, making them very complete and commodious. Our trotting course, or, in agricultural phraseology, the track, for the display of horses, is one-third of a mile in circumference, well graded and gravelled, and protected on the outside by substantial posts and ropes. In addition to the large building for the display of manufactured articles, we have a permanent and tasteful building for the offices of the secretary and treasurer, with a committee room overhead, a stable of the same character, with twenty-one separate stalls, designed for bulls and stallions, and ranges of seats overlooking the trotting course. It is believed our grounds and fixtures will compare favorably with those of any county in the State, and although these improvements have left us a trifle in debt, there is little doubt that another year will find the balance on the right side, for the society has the confidence and good wishes of the mass of the people, and evidences are abundant that it is accomplishing much good in the county. The idea has been suggested that one day, or portion of a day, be set apart for the buying or selling of stock by exhibitors and others, and it is thought by many that this practice would add much to the usefulness of our county fairs throughout the State. It is perhaps worthy of a trial.

Within a few years past the wheat crop, the great staple for which the Genesee Valley has been so long celebrated, has been almost entirely destroyed by the midge. Scarcely an acre of white wheat is now sown throughout the larger portion of our county, and the farmers are compelled

to look to other crops, and an entirely different course of husbandry to make their business a profitable one.

The subject of under-draining has received considerable attention during the past year, and some of our farmers have experimented largely in ditching lands heretofore considered dry enough for all ordinary purposes of cultivation. This is, beyond a doubt a subject of very great importance, and there are those who go so far as to assert, that with a judicious system of drainage good crops of wheat may be raised in defiance of the midge; that the land will be made so much earlier, and its producing powers so much quickened, that the wheat berry will become hard before the insect is sufficiently developed to injure it. This, however, is not the general opinion.

Several large dairies have been recently established in this vicinity, and the manufacture of butter and cheese, as articles of export, will undoubtedly be largely increased.

Our crop of Indian corn was abundant the past season, and of excellent quality. Broom corn has been raised here to some extent for many years, but latterly the breadth of ground planted has been very much extended.

The culture of Chinese sugar cane has engaged the attention of many of our farmers, and experiments have been made with it to some extent for two years past, but it is questionable whether it can ever be made profitable here, except, perhaps, in limited quantities, and in very favorable seasons

Tobacco has been grown also in some localities, and has proved a paying crop, though no where that I am aware of on a very extended scale.

An interesting feature in the State, and some of the county society reports, is the statement by the committees of the general course of cultivation, and the expenses and receipts of the farms and crops offered for premiums and examined by them. I regret that we have none such to offer. In the face of the figures shown by some of them the conclusion is irresistable, that farming is a good investment of money, and yet it must, I think, be acknowledged that these are exceptional cases; why should they not be the rule?

I annex the treasurer's report for 1858, by which it appears that the receipts from all sources, for the year, including the balance on hand at the commencement of it, was $1,767 37
Expenditures and liabilities,..... 2,443 13

Leaving a deficit of $675 76

Notwithstanding this debt, we consider the affairs of the society in a highly prosperous condition. The fair grounds are unsurpassed in natural beauty and fitness for the objects to which they are appropriated, and the arrangements for buildings, seats, stables, pens, &c., are now so nearly complete as to call for but small expenditure for some years to come, while the yearly attendance upon the exhibitions is manifestly on the increase. It is true of many of our farmers that these fairs are the only holidays they

allow themselves and their families during twelve months of labor, and for this reason alone, if for no other, they should be promoted and encouraged throughout the country, both by private effort and legislative patronage.

Officers for 1859.—President, Alonzo Bradner, Dansville; Vice-President, Fred. B. Pierson, Avon; Secretary, Henry V. Colt, Geneseo; Treasurer, E. R. Hammatt, Geneseo; Directors, Chas. Colt, Geo. W. Root, J. Barber, H. L. Arnold, A. G. Ashley, Wm. M. Mills.

WM. CUSHING, *Secretary.*

MADISON.

MORRISVILLE, *March* 17, 1859.

Dear Sir—The officers of the Madison County Agricultural Society for the present year are:

For President, J. C. Tillitson, Cazenovia; Vice-Presidents, Gardiner Morse, Eaton, D. B. Shapley, Lebanon, John Potter, Stockbridge, S. Hill, Fenner, G. D. Richardson, Nelson, O. B. Hinkly, Brookfield, H. Hunks, Georgetown, E. Lewis, Lenox; Directors, Charles D. Miller, Peterboro, John B. Coe, Madison, Wm. P. Lounsbury, Fenner, E. C. Saunders, Lenox, J. H. Dunbar, Hamilton, D. Maine, De Ruyter; Secretary, L. B. Kern, Morrisville; Treasurer, L. F. Petrie, Peterboro.

ALEXANDER W. HOLMES.

MONROE.

The annual meeting of the Monroe County Agricultural Society was held at the court house, on Wednesday, January 12, 1859, the president, D. D, T. Moore, Esq., in the chair. The minutes of the last annual meeting were read and approved, as published.

The president then submitted the following report:

REPORT OF THE BOARD OF MANAGERS.

Gentlemen of the Society: In accordance with the commendable custom which has been in vogue since its reorganization, the board of managers of the Monroe County Agricultural Society respectfully submit a brief report of their doings during the year 1858—preliminary to a more complete account of the various transactions of the board and society, which will probably be published in pamphlet form. In preparing what is now presented, our main object has been to give such a synopsis of operations during the year as would enable the members and community to form a tolerably correct idea of the present position, monetary condition, and future prospects of the society. As we must necessarily deal in generalities, merely stating facts, without entering into lengthy arguments in support of our management, or of any suggestions which may be offered, we refer, in the outset to the treasurer's report for a particular account of the receipts and expenditures during our administration.

It affords us pleasure to announce that some decided progress has been made during the past year in improving the financial condition of the society. It will be remembered that we commenced the year under very unfavorable circumstances—in the midst of a great financial embarrassment, with an empty treasury, and a debt of over $3,000, requiring early attention. Considering the times and state of the treasury, our elevation, if such it may be called, was not enviable, certainly, and every member of the board apparently appreciated the responsibility of the position assumed, in reluctantly accepting office, when it was necessary to make strenuous efforts to save the society from bankruptcy, to say nothing of placing it in an independent and prosperous condition. We knew that the prospect was most discouraging, for the financial crisis was at its height, which would preclude the sale of life membership tickets to any appreciable amount; and that, though our predecessors had nobly labored during their official term, and merited eminent success, the bad weather attending every exhibition in 1857, had rendered their efforts unsuccessful. Though a similar fate might follow our efforts, we resolved to do our duty faithfully to the society and the public, and leave the result to Providence, confidently believing that whether we failed or succeeded, every intelligent and discriminating member of the society would appreciate our intentions and efforts, under the adverse circumstances of their commencement.

At the early meetings of the board, the condition of the society was thoroughly canvassed, and no little discussion had as to the most judicious course to be pursued in order to reduce the society's indebtedness without impairing its standing and usefulness. Among other things it was early decided to offer a less amount in cash premiums than had been given the year previous. This was a delicate and difficult matter, open to objection and criticism—for the reason that some people often jump at conclusions, and unjustly condemn very reasonable and necessary measures—yet, the board resolved to be "just before they were generous," and with great unanimity decided that the creditors of the society should be paid interest, if not principal, before large cash premiums were offered in any department. Hence, by lessening the amount of some money premiums and substituting diplomas, medals, &c., for others, quite a handsome sum was reserved to be appropriated to the payment of the society's obligations. We trust the society fully approves our action in this respect; if not, all we have to offer in defence, is, that, believing it right, we "assumed the responsibility," regardless of the consequences to ourselves personally.

The next conclusion of the board was to be as *economical* as possible relative to permanent structures and other improvements on the society's grounds. Hence, as will be observed by the treasurer's schedule of disbursements, our expenditure for this purpose have been comparatively limited, and certainly far less than necessary to render the Monroe County Fair Grounds what they should be, and what we hope they *will be* ere many years. But we resolved that the present exhibition building must answer for a while—rickety and ill-looking as it was, and discreditable to the

society and the farmers of Monroe as it might appear in the eyes of strangers, and we hope in the eyes of citizens also; for it would not do to *run in debt* for a new one, especially at a period when it was questionable whether it might not be necessary to mortgage the premises to meet or secure existing obligations. Whether our course was the proper one, you, gentlemen of the Society, are probably enabled to determine.

The society held two exibitions during the year—a show of horses on the 5th of July, one day only, and the annual fair in September, from the 14th to the 17th, inclusive—four days. The exhibition of horses was creditable, largely attended, and profitable to the society. The total expenses of the show, including premiums paid, were nearly $1,300, and the receipts over $1,960—leaving a net profit of some $650. The number of entries, according to the secretary's books, was about one hundred. The weather was unusually favorable, and the attendance very large—the balloon ascension of Prof. Steiner, no doubt inducing thousands to attend who would not otherwise have been present. One word relative to this ascension, its propriety and profit. Though some may question the propriety of ballooning at agricultural fairs, and even at horse shows, we submit that it is far less objectionable than many things allowed on such occasions—especially when a society is in debt, and there is (as there was in this case and at the county fair) a strong probability of deriving no little profit from the interesting and attractive display. The complete success of the ascension in July—not only in adding dollars to our treasury, but in gratifying the people in enabling them to witness the most magnificent ascension ever made in this section of the Union—induced us to engage Prof. Steiner to make an ascension at the annual fair; and, though adverse weather prevented a fulfillment of the engagement, thousands were no doubt attracted to the grounds by the announcement, and after getting the worth of their admission money in witnessing a mammoth balloon inflated, probably saw many other curiosities and learned something useful from the general exhibition. As agricultural fairs are justly considered holidays by many who attend them, we believe it is not only allowable, but eminently proper, to offer some features that are attractive and amusing, as well as those of a practical and instructive character. The board certainly considered ballooning or ball playing proper on such an occasion as our annual fair, and inasmuch as both were very present helps pecuniarily, we will submit the question of expediency and propriety without further discussion.

The annual fair was a success, considering the unfavorable weather which set in the second day, greatly lessening the attendance and diminishing the receipts. The whole receipts (including avails of life membership tickets sold since the horse show,) figure about $3,200, while the expenses of the fair (and of the society from July to the close of the year,) as shown by the treasurer's report, amount to some $2,000. The fair was well attended, and the exhibition in most departments decidedly creditable to the society and county—albeit the storm on the second day caused many exhibitors to remove their animals and articles, in consequence of which

not a few ordinarily sensible people (who did not know or consider the facts) subsequently judged unfairly of the exhibition as a whole. We beg all such (including reporters for the press) to remember that the managers are not omnipotent, and neither control the elements nor the people when the elements threaten or injure their property. They can offer premiums, appoint the time for a fair, advise the people and induce the sensible portion of them (under favorable circumstances) to attend; but a "higher power" regulates the weather, while perhaps a lower one may govern some of the actions of individuals.

The number of entries at the annual fair was about 1,400, viz: Of cattle, 122; of horses, 141; of sheep, swine, poultry and farm implements, 196; of grain, dairy products, vegetables and household manufactures, 673; of fine arts and general manufactures, 66; of fruits, flowers and non-enumerated articles, 161; at the plowing match, 14.

Most of the premiums awarded have been paid, except to those entitled to diplomas. We have thus far been unable to procure such a diploma as was desired—as it was not thought best to get a common, cheap article—but are enabled to report some progress, and trust that those entitled to this mark of merit, will ere long receive it in satisfactory style. As to the manner and justice of the awards of premiums in the various departments, the board have only to say that especial pains were taken to appoint and secure the attendance of the most capable and reliable men in all departments, and we believe very general satisfaction was given. Errors of both omission and commission no doubt occurred, but where these were brought to our notice they were corrected whenever practicable. Our aim has been to award justice to all, and reward merit in all cases in our power, —yet no doubt both the judges and members of the board receive more curses than compliments, for that man has not yet arrived who can give entire satisfaction in either capacity. It may be proper to state in this connection that several hundred volumes of Transactions of the State Agricultural Society and Patent Office Reports, have been distributed among the unsuccessful competitors for premiums at last annual fair.

The aggregate receipts of the society, from all sources, during the year, have been about $5,200, and the total profits $2,200. This is greater than we anticipated in the outset, though insufficient to pay the indebtedness of the society, after defraying its current expenses. The fact, however, that, in addition to paying expenses, and expending a few hundred dollars in necessary improvements, *we have paid over* $1,500 of the obligations which were held against the society one year ago, is as gratifying as it is encouraging, and alike creditable to the society, its members and others who have contributed to its prosperity. The board has been nobly seconded in its efforts by many ardent and substantial friends of the society and its objects, and tender their acknowledgments for the large measure of encouragement and support thus accorded. Among others, they are specially indebted to Williard Hodges, Esq., former President of the Society,

whose advice, influence and efforts have been freely and frequently tendered and of service in promoting the interests of the society.

Such, gentlemen of the Society, is a brief synopsis of the transactions of the Board and Society during the year. That our stewardship will meet your entire approval, is hardly to be expected, yet we trust that if you do not pronounce us "good and faithful servants," we may be found so little blameworthy that the mantle of charity can cover our short-comings. Our position has neither been desirable nor enviable; and sure we are that if members and community could realize the labors and sacrifices necessary to sustain the institution, fewer complaints would be made against its officers, and none but the best friends of the Society and its objects, and such as are willing to work for its advancement, would ever accept any office it can confer. And we sincerely hope, zealous, working men, who have the good of the Society at heart, will ever occupy its positions of trust and responsibility, and such as have time, as well as inclination, to labor in behalf of the cause. An office in the Society should be considered one of the most useful and honorable positions that can be bestowed by the people of the county. Surely this Society ought to be one of the most efficient, useful, and prosperous in the land; for Monroe county has a superior soil and climate, while its agriculturists, horticulturists, manufacturers and artisans, are probably at least equal in skill, intelligence and enterprise, to those of any other county in the Union. It remains for you, gentlemen and the people of the county, to decide whether the Monroe County Agricultural Society shall become what it should be. All that is necessary to place it in a proper position, is a little personal effort and influence on the part of those interested. If you so will, the remaining indebtedness may be liquidated to-day, or in a month, and, with the affairs of the Society committed to proper direction, it will ere long assume its proper elevated position among the agricultural associations of the country.

On motion the report was accepted, adopted, and ordered published with proceedings.

Officers for 1859.—Daniel Warner, President; Jas. Upton, Leonard Buckland, P. Barry, Vice Presidents; Michael Canfield, Secretary; Willard Hodges, Treasurer.

MONTGOMERY.

FONDA, *February* 25, 1859.

B. P. JOHNSON. Esq.:

Dear Sir—The reason why you have not received the report from Montgomery county, is the absence of our former President.

The officers for 1859, are John J. Davis, President; R. H. Cushney, Treasurer; and yours, &c.,

A. H. BURTCH, *Secretary.*

NIAGARA.

B. P. JOHNSON, Esq., *Secretary State Ag. Society, Albany:*

Dear Sir—In conformity with my official duty, I herewith enclose the proceedings and report of our Agricultural Society, for the year 1858. I send it in the print, as it will enable you to compare our progress and economy with other Societies.

The Society is doing a great amount of service to our farmers. Providence conferred a great blessing in cutting off our wheat a few years since, and last year laid us under a farther obligation by cutting off our barley to a most meagre crop. I know that I am quite singular in deeming this a blessing, for they lament very much over the good times when they raised a large crop of wheat, and got the cash for it all in a lump, (and spent it very quick for traps and gew-gaws.) Now they are forced into stock, and are compelled to scratch hard to make their expenses and taxes in money; but they have all got more or less young stock and sheep growing, which they cannot sell and spend, and the county growing rich faster than it ever did before. In about four or five years more our farmers will all be well in stock, with a portion to sell annually, without stripping anything off their farms at harvest, as when they raised grain. The future has been shown this fall. Pork first comes to maturity for market of all kinds of stock. We have sold for export this fall, more pork and poultry than ever in two or three years before, and it will be increased next year, with sheep and cattle, and in a few years I think all will find that what they thought a great misfortune in the failure of grain, was a blessing in disguise.

Yours, very respectfully,

J. R. ST. JOHN, *Cor. Secretary.*

The annual meeting of the Niagara County Agricultural Society was held at Ringueberg Hall, in Lockport, on Wednesday, January 5th, 1859, and was largely attended by farmers from all parts of the county—President J. D. Shuler, presiding. The meeting was called at 10 o'clock in the morning, but adjourned without transacting any business until 1 o'clock in the afternoon. On the assembling in the afternoon, the following reports were read:

REPORT OF THE SECRETARY OF THE NIAGARA COUNTY AGRICULTURAL SOCIETY TO THE ANNUAL MEETING HELD JANUARY 5, 1859.

The past year, notwithstanding the general depression, has been one of encouragement instead of disheartenment to the friends of the Niagara County Agricultural Society, as the following exhibit of the year's affairs will show:

On the 24th of April, the first "spring show" of the society was held on its fair grounds in Lockport. This exhibition is designed as a stock sale and exchange mart, and the first exhibition was such as to confirm the faith of its projectors in its feasibility and propriety. The amount of stock that appeared on the ground was large, especially of horses and cattle, and these were of a superior character. Indeed, the exhibit of blooded cattle was larger than at the regular fall exhibition.

The autumnal show of the society was held on its fair grounds at Lockport, on September 28th, 29th and 30th, last. The two first days were propitious and the number of exhibitors, as well as the attendance, surpassed anything yet chronicled in the society's history. The number of entries was over nine hundred, against seven hundred the year previous, and the legitimate receipts of the fair were $1,102.39, against $983 the previous year. The last day of the fair, which was set apart for the plowing match, and other miscellaneous business, was characterized by a storm of unusual violence, which commenced about the hour designated for the plowing, and which caused its postponement to a future day. It was finally held on the 16th day of October, and created an extended interest. For the purpose of exciting a generous rivalry, premiums to the amount of $100 were offered for excellence in various kinds of plowing, the larger portion of which was given to boys under eighteen years of age. The number of boy-farmers who competed for these premiums, and the superiority of their work, showed that the society judged rightly in making up the awards.

The comfort, order and success of the annual exhibition was much enhanced by the presence of two large buildings which had been erected during the past year. The addition which was thus made to the convenience of guests, will, doubtless, lead to an extension of these improvements, so as to more fully accommodate the public. The large number of domestic articles is becoming a feature of the society's exhibitions, and at the last fair there were enough of these articles entered to have filled entire one of the large buildings. The show of blood, grade, and native cattle, horses, sheep, swine, and fowls, showed improvements as marked as they were gratifying.

The failure of the wheat crop, which has been, until a few years, the staple of the county, has had a tendency to improve all other branches of agriculture. Its effect upon the dairy is, perhaps, more marked than upon any one branch. The exhibition of butter on the occasion was unprecedented, and the committee, in their report, declared their embarrassment in deciding which was best, where all was so superior. The same may be said in regard to the exhibit of cheese, with a slight modification.

The almost utter failure of the apple and peach crop of the county, rendered meager what is usually one of the most attractive features of our exhibitions.

The report of the treasurer does not show the society in as flattering a condition as was hoped by many. Owing to the universal prostration of business, the notes and subscriptions held by the society have not been paid to the extent anticipated, and a corresponding amount is left unpaid on the land purchased by the society three years ago. The treasurer's report shows the following exhibit:

Received from all sources the past year,	$2,276 76
Paid out on land, premiums, and expenses,	2,252 82
Balance,	$23 94

Of this amount $950 has been paid on the land, leaving still due about $2.000. To pay this there are notes and subscriptions remaining unpaid to the amount of $1,607.25. It is hardly probable that these assets can be made to realize their face, and hence it is to be hoped the friends of the society will see the importance of coming forward and assisting in the collection of these accounts, and in raising an amount sufficient to place it out of embarrassment.

The society has paid for premiums the past year, $632.25, and there remains uncalled for but $35.75, the premiums awarded at the last annual exhibition, which amounted in the aggregate to $668.

At the time of making the last annual report there was due on the land of the society $2,606; to pay which there were notes and subscriptions to the amount of $2,328; leaving a balance of $278 over the assets provided for. On this indebtedness there has been paid the past year, $950. The debt would have been reduced still more had it not been found necessary to erect two permanent buildings which were needed for the accommodation of the society's exhibition. This caused an unusual expenditure of over $300, which will not be liable to occur again for some time.

With the grounds as now situated, the managers of the society believe that by the generous co-operation of those interested in its welfare, it is now in a position to go forward in its sphere of usefulness with a prospect of being entirely free of debt in one or two years. To this end the retiring officers have to ask that the zeal which has sustained and cheered their labors, will suffer no abatement until the society shall be free from all embarrassments. When the result shall be attained, it requires no prophetic eye to see that the society will at once increase its efficiency and usefulness. It will be enabled to offer greater inducements for superiority in agricultural pursuits, and in every way extend a greater measure of encouragement to all branches of useful industry. This prospect should, and we hope will encourage every farmer, mechanic and business man in the county to keep his shoulder to the wheel until the desired object is accomplished.

All of which is respectfully submitted,

S. S. POMROY, *Rec. Sec'y.*

On motion, the meeting proceeded to the election of officers, by ballot, with the following result:

President, William Weld, of Lockport; First Vice-President, O. P. Knapp, Lockport; eleven Vice-Presidents; Recording Secretary, N. M. Spalding, Lockport; Corresponding Secretary, John R. St. John, Lockport; Treasurer, Roland Sears, Lockport.

After the election of officers, Hon. Thos. T. T. Flagler, was introduced to the society, and delivered a brief but very interesting address, replete with practical suggestions and philosophical deductions.

On motion the thanks of the society was tendered Mr. Flagler, for his excellent address.

Finances.

Receipts,	$2,276 76
Expenditures,	2,252 82
Balance,	$23 94
Amount due society,	$1,631 19

ONEIDA.

To B. P. JOHNSON, Esq., *Secretary:*

Dear Sir—In compliance with the statute, I herewith transmit a report of the proceedings of the Oneida County Agricultural Society for the year 1858.

The annual meeting of the society was held at the Central Hotel, Utica, on the 6th of January, 1859, at which time premiums were awarded on fruit, grain, root crops, &c. Mr. N. S. Wright, of Vernon, received the first premium on Indian corn. In his statement he says, "that the soil was a gravelly loam; that the previous crop was corn and potatoes; that he plowed in twenty-five loads of barn-yard manure—depth of furrow ten inches—after which ten loads of fine manure was spread upon the surface and harrowed in. The amount of land was 99-100 of an acre. The total expense of cultivating and harvesting crop, was $26.38.

No. of bushels of corn was 90 35-56, at 6s.,	$68 00
Stalks,	4 00
	$72 00

Profits of the crop $45.62.

Mr. Morris Cushman, of Vernon, raised 35¼ bushels of winter wheat from one acre of ground, but on account of the incompleteness of his statement, he was not entitled to compete, although he grew the largest crop.

On winter rye the first premium was taken by Wm. Ferguson, of Oriskany Falls. Crop, 38 44-58 bushels per acre; it was grown after corn, on gravelly soil, without manure, plowed but once. Depth of furrow, five inches. Sowed the last of August, two bushels of seed to the acre.

Value of the crop, including straw,	$42 00
Expense of cultivating and harvesting, and interest on land,	14 50
Profit,	$26 50

The show of fruit was very creditable for the season, as but very little fruit has been raised in the county the past season, less probably than for a great number of years.

The autumn exhibition was held on the fair grounds at Rome on the 28th, 29th and 30th of September previous. The grounds, including about 20 acres, were well arranged, and fitted up with very commodious buildings, pens, stalls, and in fact all the et cæteras necessary for the ample accommo-

dation of the exhibitors and visitors, including an excellent track half a mile in circumference. The display in the several departments was unusually extensive, and the competition spirited. There were between three and four hundred head of cattle on the ground. The ex-committee this year, for the first time, offered distinct premiums for *thorough-breds*, which brought out some fine Devons from the herds of Benjamin N. Huntington, of Rome, and J. S. Eastman, of Marshall; also quite an extensive display of thorough-bred Short Horns from the herds of B. N. Huntington, Goss & Merryman, Oriskany, A. W. Reynolds, Augusta, Jonathan Talcott, Rome, H. N. Carey, Marcy, and Thomas Holtby, Western. This separating thorough-breds from grades is a new feature in our exhibition, and has operated very favorably, eliciting a spirited competition among our best breeders. The display of horses was exceedingly fine, and large beyond all precedent; and the trotting and walking matches drew and held large crowds in the vicinity of the track. The exhibition of sheep and swine was well sustained. The specimens present evinced improvement as well as care and skill on the part of the breeders. The show of miscellaneous articles, including farm implements, farm wagons, carriages, &c., an almost endless variety, of the handy-work of our manufacturers and artizans, was well worthy of the exhibitors and of the county. But floral hall, decorated with exquisite taste and skill by the ladies of Rome, who by the way are adepts in this kind of decoration, filled up with a great profusion of useful and ornamental articles from the hands of our farmers' wives and daughters. The hall was constantly thronged with an admiring concourse. The show of vegetables elicited much praise, not only for its vast extent and variety, but for the superior quality of the specimens. One quite attractive feature in this department was the *Sorghum* or Chinese sugar cane, entered by John Ward, of Rome, and the manufacture of molasses therefrom on the ground. Mr. Ward says it was grown on rich gravelly loam soil, planted May 15th, and cultivated same as Indian corn; howed twice, and cut September 29th; leaves stripped, and top or tassel cut off, and brought directly to the fair ground; crushed and boiled into molasses same day; number of hills cut and crushed was ten; number of gallons of juice seven, which made one gallon of molasses. The committee in their report of it say "that the molasses was very good, of a decidedly pleasant taste, and it is believed with a little more care in cleaning or purifying, would be equal to the best maple syrup. On the whole, by what information they have been able to gather from the various experiments tried in various parts of the county, the committee are of the opinion that the *Sorghum* can be raised wherever Indian corn will grow, and will produce from five to ten barrels of molasses to the acre, besides a large amount of fodder in leaves, tops, &c., which cattle and horses eat with great avidity. The committee saw on the ground ripe seed from the garden of O. B. Pierce, Rome, taken from cane planted the first day of June. They are glad to find that experiments are being made in different parts of the county, and believe that the day is not distant when

Sorghum will hold an important place among the agricultural products of the county and State."

The plowing match which came off the first day of the fair was a triumph in its way, being the largest and most interesting by far, ever had in the county. I take the liberty to subjoin the following extract from the committee's report:

"Since man was ejected from that garden where all his wants were spontaneously supplied, and the curse pronounced that for his transgressions he should eat his bread by the sweat of his brow, that instead of more genial productions thorns and thistles should spring up, it became necessary to make mellow and pulverize earth's surface to receive the seed of those cereal plants whose seeds form that most important desideratum of food, to wit, bread. For this purpose plows were constructed, and among the earliest recorded labors of the agriculturist, plowing is named as the most important.

"The early implements used for this purpose were extremely simple and rude; and in those early days of the world, which may well be termed antiprogressive, centuries witnessed but little improvement in material or construction, while pyramids, triumphal arches and amphitheaters were constructed so enduring as to be handed down through all succeeding generations as stupendous monuments of the folly of their builders. But thanks to the All-wise Disposer of events, men of science in this age, instead of raising such monuments, have turned their attention to those improvements that tend to alleviate and lighten the toil of man and beast. Prominent among these are the labor saving inventions for the benefit of the farmer. Although Fulton, by the application of steam to the propelling of boats, converted our rivers into race courses and our oceans into ferries; although steam in a harness draws our passengers and freight over the iron road, vieing in swiftness with the wind; although Doctor Franklin's subjugated lightning is taught by Prof. Morse to talk from continent to continent through a wire cable under the bosom of the broad Atlantic, yet we hazard the assertion that the invention of the cast iron plow by Jethro Wood has been of more real benefit to mankind than either of them. We are aware that this is a bold assertion, but when we consider the millions and millions of acres that have to be plowed to fit them for the sustenance of the almost countless family of man, and that the cast iron plow saves at least one-half the labor of man and team from any previously in use, we fear not contradiction. While the steam whistle goes shrieking through the land, and electricity is conveying our messages from city to city, the cast iron plow is noiselessly and quietly turning its straight even furrow through the soil, developing the resources of mother earth, and making glad the hearts and stomachs of the entire human family. This question has also developed another triumph of skill in the holding of it. Its skillful management now almost assumes to a science, and we are proud that from observation we can truly assert that the plowmen of Oneida hold no second rank with her

sister counties; that they are no laggards in this most important of all the work of the farmer. At the plowing match this year the competition was most generous, fifteen teams having been entered for the honorable contest. And although we feel bound to make selection for promiums, yet the task is most difficult where all have done so well, and we feel compelled to say with the poet, that

> " 'Tis not in mortals to command success,
> But they've done more, they've deserved it."

The annual address was delivered on Wednesday the 29th by ex-Gov. Hunt to a very large and attentive audience. I have not space to speak of it at length, but it was eminently practical and sensible, abounding in valuable suggestions, and well calculated to stimulate the farmer to renewed energy in his calling. On the whole, we think it safe to say, that the past year gives abundant evidence of progress in agriculture and prosperity in our society.

Officers for 1859.—President, A. Van Patten, Rome; Vice-Presidents, Horace Dunbar, Camden, and Orrin Terry of Marshall; Executive Committee, Geo. Benedict, Verona; David H. Currie, Augusta; Steven A. Coville, Vienna; Charles P. Williams, Boonville; Wm. Potter, Marcy; Wm. Ferguson, Oriskany Falls: S. S. Greenman, Utica; J. H. Eastman, Waterville; G. C. Palmer, New Hartford; Walter Fowler, Trenton; Treasurer, H. R. Hart, Whitestown; Secretary, Sidney A. Bunce, Vernon Center.

I enclose the treasurer's report for the year ending January 1, 1859.

Receipts, including balance last year ($254.29),	$1,967 69
Expenditure,	1,711 80
In treasury,	$255 89

SIDNEY A. BUNCE, *Secretary.*

ONONDAGA.

The annual meeting of the Onondaga County Agricultural Society was held on the second Monday in January last, when John M. Strong, of Onondaga, was duly elected President; Richard F. Stevens, Secretary; Charles Pope, Treasurer, and a full board of managers for this year. The meeting was well attended, and a strong desire was manifested to so manage the affairs of the society as to free it from the embarrassments which had existed for some time past, growing out of the purchase of permanent grounds for annual fairs, and much confidence was expressed in meeting the dues of the society from proceeds of the coming fair.

The fair was held on the 22d and 23d of September. A fine building had been erected by subscription on the grounds, and every possible effort was made to induce a large attendance of exhibitors. It was well known that our county abounded in products and stock of the finest quality for

exhibition and competition, yet the exhibitors were few compared to former years, and the attendance small. It being known that the State fair was to be held at the same place, with but a few days intervening, great numbers, who are usually active at the county fair, were induced to reserve their stock and articles for that occasion. The fair resulted in disappointment, so far as former anticipations were made, and not enough was realized to meet the current expenses. It is hoped action will be taken at the approaching annual meeting to secure favorable results in the future. Although the attendance was small, yet the quality of stock and produce on exhibition was unusually meritorious, and those stand-by farmers who brought in their stock, notwithstanding their intention of exhibiting at the State fair, are worthy of commendation. A most excellent address was delivered by J. G. K. Truair, Esq., proprietor of the *Syracuse Journal*.

The crop of fruit in our county has been short this season, but other crops generally were good; potatoes and corn unusually abundant. It is to be hoped a suitable allowance will be made in our behalf by the public, on account of the circumstances by which we were surrounded at the time of our fair. RICHARD F. STEVENS, *Secretary*.

Officers for 1859.—President, James M. Munro, Camillus; Vice-Presidents, Silas Corey, Otisco, and George Butts, Manlius; Secretary, Hiram Wiard, Syracuse; Treasurer, Charles Pope, Syracuse.

H. WIARD, *Secretary*.

ONTARIO.

CANANDAIGUA, *February* 28, 1859.

I have to apologize for the delay in sending the yearly report of this Society, but as the winter meeting closes the yearly work, the report would not be complete unless it contained the result of this meeting.

Like many of our co-workers, we suffered last fall from the effects of the heavy storms which seem destined to interrupt the successful operations of out-door exhibitions during the fall. But even with this drawback, our returns show a decided step in advance of previous years.

At our annual fair exhibition, the entries in all classes were 1,312, against 1,069 the year previous. Of these, there were 285 entries for cattle and sheep, comprising 482 head; 231 entries of single and matched horses, comprising 292 head; 229 entries of vegetables; 150 entries of farm implements and machinery; the balance made up of an excellent list of poultry, swine, fruit, butter, cheese, and all the various products of the farmer's household. The display of cattle and sheep and horses was above the usual standard, and as many of the same were subsequently awarded first premiums at the State exhibition at Syracuse, their quality needs no further endorsement.

The first day and part of the second were all that could be desired for salubrity, and the success of the exhibition in proportion. Soon after two

o'clock P. M., however, of the second day, a storm of wind and rain, remarkable for its severity and protracted violence, broke over our neighborhood, and most effectually stopped all further out-door action. Our large amphitheater was again tested, and its usefulness in affording protection to all who would partake of its shelter, was amply demonstrated.

The cash receipts for this day and a half, at the desk of the treasurer, were $2,375—a pretty sure indication of what might have been the result of three good bright days. As it was, the sudden storm at once put an end to the work of the Society, the committees were adjourned for a fortnight, and the gates to the grounds thrown open to the free ingress of all.

The officers and others interested in the progress of our Society, feel a solid gratification in the fact that the county continues to exhibit an increasing interest in these annual displays. There were 150 entries of agricultural implements, (these were all on the ground,) many of them bulky and unwieldy, expensive to transport, and liable to injury from careless handling on the road, testify to the truth of this assertion. And although we do not wish to exult, it was admitted by good observers, that our display as a whole was not surpassed by any county exhibition of the year.

In order to exhibit the amount of monies passed by the Society, I annex the following table:

Receipts for 1854,	$3,460 11
1855,	2,107 91
1856,*	10,134 50
1857,	2,549 03
1858,	2,583 23
Total,	$20,834 68

The expenditures of the Society exceed this during the same period about $2,300, which stands as a debt against the amphitheater. Strong hopes were indulged that our last fall exhibition would greatly lessen, if not extinguish, this debt, but, as before said, the elements were against us, leaving our receipts but $400 or thereabouts in excess of our expenditures.

From the reports of various competitors for the premiums, I extract the following:

H. M. Boardman, of Gorham, who received the first premium for milch cows at the fall exhibition, as well as the first premium for the greatest amount of butter from one cow, at the winter exhibition, reports: "The experiment was made in the month of June, 1858. The feed previous to trial was roots, corn meal and hay; during the experiment was grass only, except half bushel of beets on each of the first two days. The cow is three-fourths Durham and one-fourth native. Total pounds of milk during the month of June, 1,586½, from which was made 66 14-16 lbs. of butter." A sample of the butter was exhibited.

H. H. Brown, of Victor, awarded second premium for milch cow, says "his cow is a cross of Durham and Devon. Fed on timothy and clover.

* The amphitheater was built this year.

The yield of milk, from 13th June to 12th July, was 1,479 lbs.; the quantity of butter from same, 66½ lbs."

R. H. Woodard, Gorham, to whom was awarded the first premium for best field of winter wheat, reports: "The field is gravelly loam; was but lately cleared; plowed and dragged the year previous to sowing; *it had no crop on before;* summer fallowed by plowing three times, and dragging at each time it was plowed; *no manure used;* sowed broadcast on the 10th September, 1857, with Mediterranean wheat; quantity of seed, nine and a half bushels on five acres and a quarter. About one-quarter of an acre was winter killed. Harvested first of August, 1858, and yielded one hundred and twenty-three bushels of wheat, by weight, which is 32 57-60 bushels per acre. The land was much encumbered with stumps, as the previous timber was very heavy, and much of it was beech.

"The straw was quite heavy and long and badly lodged; the wheat of first quality. The return includes the whole field, although about one-quarter acre was entirely destroyed, as already stated."

It would seem from this report that there are a few spots left in western New York where the old glory of the Genesee country yet glimmers.

Thomas Price, of Canandaigua, awarded first premium for field of spring wheat, put in his affidavit to the following effect:

"The field contains 4 74-160 acres; about one acre of this was formerly a marshy swamp, producing nothing but rushes and wild grass, until 150 rods of drain was put through this wet spot, about four years ago. The product of the present year was 129 4-60 bushels first quality spring wheat. The previous crops were barley, after corn. The field was plowed in April, 1858, on the 12th, 13th and 15th, and sowed by hand on the 16th, with Canada club wheat; amount of seed 6½ bushels; total expense of cultivation, $29.37. No manure was applied for this crop. About ten loads of manure were put on the poorest parts of the field, previous to the barley crop, and about thirty loads manure for the corn crop in 1856. Estimates the increased value given to each crop has paid in full the entire expense of draining."

James McB. Gillet, of Hopewell, first premium for field of Indian corn, reports:

"The field contains just two acres; the product, as certified, was sold to Bierce Warren, & Co., Shortsville, and weighed 7,838 lbs. shelled corn, say 56 lbs. to the bushel, 140 bushels.

"The field was a clover lay of two years standing; soil, loam. The lot was seeded to red clover, on wheat, in April 1855, at the rate of ten lbs. per acre; plastered in June, at the rate of one bushel of Seneca plaster per acre. In 1856 two crops of clover were taken from the field: the first for hay, the second for seed; in 1857 it was used for pasturage; in May, 1858, before plowing, I spread twenty-five loads ordinary barn-yard manure, plowed nine inches deep, dragged, and marked both ways three feet five inches apart; planted by hand on the 21st day of May, with large eight row yellow corn, using six quarts seed per acre; cultivated and hoed

twice; cut and stacked in September; husked and cribbed in October; total expense of culture $22.56."

J. S. Tillotson, Canandaigua, to whom was awarded the first premium for rye, certifies to the following:

"The field contains 4¾ acres. Two years previous to the sowing of the rye, about twenty-five loads manure were hauled to the lot and left in heaps. The lot had been pastured up to six months previous to the time of sowing, when it was broken up. The land was then dragged twice and culticated twice before sowing, but was not plowed. After sowing, the field was dragged once each way. One and a half bushels of good rye was sowed by hand to the acre; harvested on the 9th September and thrashed with a flail. The stubble was not raked. The yield was 129 bushels. The expense of cultivating the crop was $43.32."

C. Woodruff, Canandaigua, first premium for white beans, says:

"The land measured 119 rods and 7 feet. Tilled as follows: Meadow land turned over the 4th and 5th days of June, 1858; seed immediately drilled in with one of Emery's corn planters; rows from 2½ to three feet apart; seed used, fourteen quarts; yield by measure, 22½ bushels, by weight, twenty-four bushels and twenty-two lbs."

Walter Marks, Hopewell, first and second premiums for potatoes, has a certified report. He cultivated two plots. Plot No. 1 contains 155 rods. Seed to the acre seven bushels, variety "South American;" no manure applied to the land for five years previous to preparing for this crop; the past three years in clover; planted 8th of May; each potatoe cut once in two; half potato to a hill. On the 25th June, passed through both ways with a shovel plow, and followed with a hand hoe, hilling up well. Yield on this plot 282 bushels, or at the rate of 291 1-6 bushels per acre.

Plot No. 2 contains 155¾ rods; had upon it one crop of corn, three of potatoes, and one of wheat within seven years previous to the present crop. In the fall of 1855 it was well manured with common stable manure; plowed and worked and sowed to wheat; seeded to clover the following spring. For the present crop thirty loads common barn yard manure were used. After planting the potatoes, half bushel of plaster was applied, by putting a handful *in* each hill. Other cultivation the same as plot No. 1. Is of the opinion that the application of plaster *in* the hill is very beneficial, improving the quantity and quality of the crop, especially where barn yard manure has been applied. The yield of the plot was 262 bushels or at the rate of 270 to the acre. The soil of both plots is a sandy loam with a stiff hard pan, eighteen to thirty inches from the surface.

O. E. Crittenden, Canandaigua, was awarded first premium for crop of clover, his statement is this:

"The field contains seven acres. 131 rods yield 4 42-60 bushels per acre. The first crop of hay was taken from the field 22d June, then applied five pecks of plaster to the acre; sowed broadcast; no plaster on the first crop."

The first premium of $25 "for the greatest number of rods of tile or stone drain, put down in the year 1858—drains to be not less than 2½ feet deep," was awarded to Mr. William Johnson of Seneca. The State society subsequenty awarded a premium for the same plot, and I respectfully refer those interested to his statement and map, which will doubtless accompany the documents appended to the State society proper. (*Vide ante* p, 226.)

The second premium of $15, for draining, under the above rule, was awarded to Thomas Tafts, of Gorham, whose statement you will find herewith.

After the award of these premiums the society proceeded to a revision of the rules, and increase of the premiums for the next autumnal exhibition. Then followed the election for officers to serve the present year, with this result:

President, Wm. H. Lamport, of Gorham; Corresponding Secretary, Gideon Granger, Canandaigua; Treasurer, J. S. Cooley, Canandaigua; Recording Secretary, J. W. Holberton, Canandaigua; with the usual Vice-President from each town, and town committee of three.

In conclusion, it is to be regretted that we possess no reliable statistical data, of the value of our various crops, further than rude estimate, or the census returns to State or general government, which are too wide apart for real utility. For while it is very certain that the former sure and staple field crops of this county are no longer relied upon as a source of profit, it is equally true that we have no sure indication as to what point the farmer's industry shall be turned so that it can produce a satisfactory reply to the important question, "does it pay?"

JOHN W. HOLBERTON, *Rec. Sec'y.*

THOMAS TREFT'S STATEMENT OF DRAINAGE.

I have laid 500 rods of tile drains. Two thousand of my tile were one inch and a half; these I laid at the top of my drains; then I commenced with two inch tile for the lower part of my drains. I dug my drains from two feet and a half to three feet deep, and forty feet apart. The soil is of a clay loam. The lower part of the land is mixed with veins of quicksand. The cost of my tile drains is twenty-eight cents per rod; for stone drains 37½ cents per rod. The effect was, the ground was wet when I commenced draining, and in the course of a few days the ground was ready to plow and in good order. I finished draining December 28, 1858.

P. S.—I used Slone's ditching plow. I have laid sixty-six rods stone drains.

ORANGE.

To B. P. JOHNSON, Esq.:

The eighteenth annual exhibition of the Orange County Agricultural Society, was held at the village of Montgomery, Sept. 29th and 30th, 1858, and was one of the most successful ever held by the Society. The attendance was very large. The weather was all that could be desired, both days being bright and mild. The arrangements were excellent.

The grounds selected for the exhibition are located in the southern part of the village. They enclose an area of about ten acres, and are well adapted to the purpose for which they were appropriated. The Society's tent was erected in a central and conspicuous position. Suitable portions of the enclosure were assigned respectively to each class of animals.

THE EXHIBITION.

Horses.—The show of horses was very creditable. Among the number were many noble animals—fine specimens of equine strength, grace and beauty. The great and increasing attention that has for the last few years been bestowed by the people of this county upon the rearing and training of horses, has evidently produced a marked improvement in our stock of horses. Labor, expense and care have not been spared in the effort to effect this improvement, and the result has fully justified the amplest outlay that has been made. The roadsters of Orange county are to-day, in point of symmetry and speed, second to none.

Cattle.—The show of cattle was in most classes very good. The display of milch cows was well worthy of the first milk and butter county of the Union. The fresh pastures and pure water of Orange, will always enable her to rank pre-eminently as a *dairy county*, while the discrimination and judgment which our dairymen exercise in the selection and management of milch cows, will maintain the high character of our dairies. This being the case, our farmers will be enabled to look upon their dairies in the future with the same pride and pleasure that they have regarded them with in the past.

Sheep.—The display of sheep was creditable to the county. The several grades of fine, middle, and long wool, were well represented. Except a few choice flocks that are bred with care, the sheep of this county are a mixture of every grade, kept more for market than for wool. Unlike some sections of the State, here the flock is not a permanent attachment to the farm. Most of our sheep are brought from the west in autumn, purchased by our farmers, fatted and sold the following season. The system, as it is pursued, is profitable.

Swine.—The exhibition was excellent in the *quality* of the animals, rather than in the *number* shown. Some animals were almost perfect specimens of their kind. Several of the most popular breeds were represented. Most of the prizes were awarded to Berkshires. There is considerable pork fattened in this county, and it is to be regretted that more attention is not paid to the selection of breeds of swine.

Poultry.—The show of poultry was excellent, and seemed highly gratifying to the numerous admirers of the feathered tribe.

The display of agricultural implements, machinery, &c., was quite extensive, and contained many articles new in character, and of acknowledged usefulness; their superior workmanship and neatness of finish, as well as adaptation to use, evinced, in an eminent degree, the skill and practical talent of our mechanics.

THE TENT.

The display of articles in the tent far surpassed, both in quality and variety, all previous exhibitions.

The numerous specimens of farm produce were very fine, and afforded a cheering evidence of the healthy condition of this branch of the agricultural interest of our county.

The superior quality of the various samples of dairy products, fully sustained the high reputation of the dairy-maids of the county.

The show of horticultural products was very extensive and interesting, and would compare favorably with many State exhibitions. In this department, Mr. J. M. Morrison, of Montgomery, exhibited a collection of flower and garden seeds, which, for variety and quality, as well as taste and skill in arrangement, were entitled to and received the highest commendation.

The ladies' department was fully as successful as any other. In domestic industry and the fine arts, many things were exhibited showing much genius in their design, as well as talent in their execution, and reflecting much credit upon the exhibitors. It is gratifying to state further, that the fair contributors to this department in large numbers graced this "farmers' festival," and materially added to its interest and attraction.

The plowing match took place on the second day, and was witnessed by a large number of spectators.

The annual address was replete with practical wisdom and sound sense, and was well received.

The delivery of the address was followed by the election of officers, and the award and payment of premiums.

The finances of the Society are in a flourishing condition. The report of the treasurer shows a large surplus in the treasury.

The unparalleled success which has attended the operations of this Society during the past year, evince the growing favor with which it is regarded, and the public confidence which it commands. These will illumine its future history, and enable it to enlarge its sphere of usefulness.

The following gentlemen were elected officers for the ensuing year:

President, Alden Goldsmith, Blooming Grove; Vice-Presidents, one from each town; Recording Secretary, John E. McConnell, Goshen; Corresponding Secretary, David A. Morrison, Montgomery; Treasurer, Wm. M. Sayre, Goshen.

Executive Committee—William M. Dolsen, Middletown; Nathaniel Van Sickle, Goshen; John M. Quackenboss, Montgomery; John H. Jackson, Blooming Grove; S. Hopkins, Goshen.

The present condition of Orange county is gratifying to contemplate. The state of her agriculture is constantly advancing. New and improved modes of tillage are being practiced. The aid of science is invoked. Draining is extensively practiced, and with the best results—many acres of waste and unreclaimed lands are yearly brought under cultivation. The resources of the county are being more and more developed. The value of

her real estate, already great, is rapidly increasing. The past season has been eminently prosperous to her. Her fruitful soil has yielded abundantly, and her staple products have commanded a remunerative price in the market of the land. HAMILTON MORRISON, *President.*

ORLEANS.

Since our last annual report this society has built a frame building on our fair grounds, 30 by 72 feet on the ground, the first of a group, which, when completed, will accommodate our fairs with a shelter for visitors and articles on exhibition, and afford protection to such delicate fabrics and fruits as are not now freely brought forward, from the difficulty experienced in preserving them from injury or destruction.

The first show of horses exclusively ever held by this society took place August 29th last, for one day. The total of entries at this show was seventy-five; the amount of premiums paid was $205.

As this was rather an experiment, but small premiums were offered. The result netted to the society about $300 in money, producing a happy feeling among all concerned, and we think will tend to the improvement of horses in this part of the State.

We believe horse exhibitions may be held by agricultural societies without degrading them with the vices of the race course, and that the speed of horses may be sufficiently tested there without the trickery of jockeys or the gambling of their employers, and without depriving the spectators of their interest in the display.

Our general fair for the year was held September 29 and 30. The second day was devoted to the plowing matches and awarding premiums.

The number of entries of all kinds for competition was 575, and the amount of premiums awarded was about $400.

We adopted the rule, as far as possible, to reward skill and ingenuity in works of fancy and domestic handicraft, by prizes of some useful article, rather than money, a plan which has met with general approval.

The show of fine cattle, in number and quality, was better this year than at any former fair in this county. The Durham and Devon breeds are most in favor with our farmers. The fine herd of Herefords, owned by Messrs. A. and H. Bowen, of Medina, may be noted among the best of the kind in the State.

Wheat, till within a few years, has been the great staple product of this county, engrossing the main tillage of the farms. The ravages of the midge have almost destroyed this crop, and now few farmers in Orleans county attempt to raise white wheat. Within two or three years some good crops of Mediterranean, or red wheat, have been secured here, that variety appearing to resist the midge best.

Barley and rye are largely grown in place of wheat, but beans are our principal article for exportation.

Apples are extensively cultivated for market, and more attention is being given to pears and grapes, to which our locality is found well adapted. Our experiments with the Chinese sugar cane have not been successful.

The annual meeting of the society was held the third Monday in November, when the address was delivered by Hon. T. C. Peters; subject, "Draining Land."

The receipts of the society for the current year, including the balance brought forward from last year, amount to $1,984 41
Expenditure,..... 1,665 66

Balance, ... $318 75

Officers for 1859.—Timothy C. Bailey, President; Oliver Morehouse, Secretary; Arad Thomas, Treasurer, all of Albion.

ARAD THOMAS, *Treasurer.*

OSWEGO.

B. P. JOHNSON, *Secretary New York State Agricultural Society:*

The Oswego County Agricultural Society held its 19th annual fair on the 22d, 23d, and 24th of September. The occasion was one of great interest, elicited an immense throng of visitors, and furnished conclusive evidence that these exhibitions are growing in favor, and are both manifesting, and working out, a marked improvement in the various branches of productive industry.

The grounds selected were near the Fulton Depot of the Oswego and Syracuse Railroad, and extended along the shores of Lake Neatahwanta. They contained twelve and one-half acres of land, in a rectangular form, gently rising from all points toward the center. A well graded track forty feet wide, and precisely one mile in length, was prepared for the exhibition of horses. About one-third consisted of an open grove, in which pens were constructed and posts set to accommodate the stock.

Besides the business office and other small structures, two tents, one 40 by 60, and the other 40 by 120 feet, were erected and provided with suitable fixtures for the exhibition of fruits, flowers, vegetables, domestic manufactures, specimens of the fine arts, &c., &c.

The entire area, except the side bordering upon the lake, was inclosed by a high board fence, and in all respects fitted up in admirable style. A more beautiful or more convenient spot for such an exhibition can hardly be imagined.

Taken as a whole, the display excelled anything of the kind ever before witnessed in the county. The annexed schedule of the secretary shows that there were over 1,600 articles on exhibition. The following are some of the prominent features of the occasion:

On the first day, long strings of town teams, drawing corresponding wagons, decorated with farm products, attracted much attention as they

came upon, and were driven around the grounds. The one from Granby numbered 35 yokes. That one from New Haven numbered 20, and was especially remarkable for the superior fineness of its every yoke. One of the New Haven string, (that of Mr. James Scarritt,) was removed to exhibit the perfection of the "breaking." They manifested a docility and an obedience to his every command, whether in the yoke or out, which we have never seen equalled. There were over 100 yokes of oxen on the ground, and the show of cattle in all departments was good.

The attention to working oxen is, however, yearly diminishing. As stumps disappear, and harvesting and other agricultural machinery comes into more extensive use, horses are more exclusively employed.

Steers are less and less frequently broken, and are generally sold when two or three years old. As dairying is the most prevalent occupation of the farmers of this county, the heifers are more generally raised.

On the second day of the exhibition horses were a prominent feature. The number was 138. At least three of them, I believe, afterwards received first premiums, and others took very high rank, at the State fair. The breeding of horses is every year increasing in importance in this county. As the highest prices are paid for roadsters, these seem to be receiving most attention, but draft horses have usually been in good demand.

The fire companies of Oswego and Fulton, in full uniform, accompanied by a band of music, passed a review on the ground, and exhibited the efficiency of their engines.

The exhibition of fruit, despite the unfavorableness of the year, especially that of apples, grapes, and pears, was excellent, and furnished evidence that Oswego county is advancing in this branch of culture. Although resting upon the same geological formation, and partaking particularly in its western part of the same characteristics of climate, as the famous fruit region west of the Genesee, and north of the Ridge, it was formerly very much behind that section; but the inferiority is now rapidly diminishing. Not only has the demand at home for fruit, and trees from our numerous nurseries, become highly remunerative, but the export trade is also a large and an increasing one.

Another, and perhaps the most marked feature in the exhibition, was the enlarged display of vegetables and labor-saving machinery. The collection of the products of the garden were contributed not only by the amateur cultivators, and by the market gardeners, whose business is every year increased in importance by the growth of the villages and city in our midst, but to a considerable extent by farmers, and showed that an increasing number of them are bestowing more attention upon their gardens, and treating themselves and their families to a larger variety of these home produced luxuries.

The unprecedentedly numerous and useful show of implements and products of ingenious mechanism, was not only an index of the rapidly increasing employment of brute and inanimate forces, and cunningly devised

machinery, to lighten the toil and increase the efficiency of man's hands and head, but also of the rapid development of this branch of manufacture in our midst.

The following extract from the report of the committee on field crops, affords data by which to judge the standing in that department. After specifying their awards, they say:

Adequately athenticated statements accompanied the entries, from which we make the following abstract:

Mr. Jesse Babcock's crop of corn from an acre, amounted to 7,524 lbs.; making 190 bushels and 24 lbs., at 75 lbs. per bushel, corn and cob; 194¾ bushels of ears, as measured in the basket.

The land had lain in grass three years as a meadow. Previous to being laid to grass it had on it first a crop of corn; second, a crop of wheat; third, one of oats. The soil is a gravelly loam, with gravel and sand subsoil and some small stones.

The ground was plowed about the 15th of May with a No. 22 Peekskill plow, about ten inches deep. Thirty loads of stable manure were plowed under. It was cultivated and harrowed lengthwise of the furrows; marked out with a chain—rows 3½ feet each way, and planted May 29th, with a mixture of Dutton and small eight-rowed yellow corn, tarred and plastered. About the 29th of June commenced cultivating; went twice in a row each way, and hoed on the 25th; then put on the hill a mixture of lime, ashes and plaster, about six bushels to the acre. On the 15th of July cultivated and hoed as before, and thinned out to four or five stalks to the hill. Cut up by the roots and shocked Sept. 20th and 21st, husked and measured on the 18th and 19th of October. This crop of corn was a part of a field of six acres, all treated as nearly alike as possible, and which yielded to the acre 90 bushels sound corn and about eight loads of pumpkins.

Expenses of Crop.	*Dr.*
To one day's plowing,	$2 50
cultivating and harrowing,	1 00
marking and planting,	1 00
cultivating both times,	1 50
hoeing "	2 00
cutting $1, husking $4,	5 00
seed and interest on land, at $75 per acre,	5 50
manure, drawing and spreading,	16 50
	$35 00
	Cr.
By 100 25-75 bushels, at 75 cts.,	$63 00
stalks and pumpkins,	7 00
	$70 00

Balance in favor of crop, $35.

Mr. Harvey W. Smith harvested from an acre of land 180 bushels of ears of corn. The soil was clayey loam, slightly mixed with gravel, and had been so much exhausted by previous cropping, that it did not the preceding year produce half a ton of hay per acre. In the month of April, 1858, twenty-five loads of barn-yard manure per acre were spread evenly over the surface, and on the first of May plowed under to the depth of seven inches. The soil was then well pulverized with harrow and cultivator; furrowed—the furrows some three or four inches deep and three and a half feet apart, marked at right angles with the furrows, the mark being an equal distance apart with the furrows, and on the 18th day of May planted. Previous to planting, half a shovelful of rotted barn-yard manure was applied to each hill. The corn was hoed twice during the summer, a cultivator being used each time. It was cut up by the roots and shocked in the month of September, and husked and measured in October. Variety, Large Dutton.

Mr. Gardner Briggs prepared the ground for his crop of winter wheat by breaking early, and subsequently dragging and plowing in the usual manner of thorough summer fallowing. The field had previously been in pasture. Before the third, which was the last plowing, manured with well rotted manure. Sowed two bushels of Soule's wheat to the acre the last week in August. The crop was harvested the middle of July, and thrashed the 30th of September. Two acres duly manured and saved by itself, yielded precisely thirty bushels to the acre of excellent wheat.

Mr. Strong raised his spring wheat upon a piece of ground previously well fitted for corn. The only preparation for this crop was a simple plowing and harrowing in the spring. Sowed the China Tea variety, at the rate of one bushel and three pecks to the acre, and when fairly up sowed three bushels of lime to the acre. The piece of land whose product was measured yielded sixty-two bushels and three pecks, and contained two acres and fifty-four rods.

Mr. G. W. Thomas cut from one-half acre of osier willow 2,800 lbs. The willow was set out in the spring of 1856. The ground was prepared and the settings treated the first year in the same manner as corn, since which time it has received no attention.

Mr. A. Matson raised his turnips upon land which had previously for some time been in pasture. After the sod had been turned, about twenty loads to the acre of compost, prepared the year previous, by mixing one load of muck with two of stable manure, was spread upon the surface and dragged in. The seed was sowed in drills two feet apart on the 27th of July. He hoed twice, and a portion three times. Thinned out the first time hoeing, and subsequently filled the vacancies by setting out so that the plants stood at distances of about twelve or fifteen inches. The yield was ascertained by measuring in a bushel and a half basket. There were four hundred and seventy-five bushels gathered from the half acre.

The crop was very much injured by the grasshoppers. Mr. Matson says the crop would have been nearly twice as large had it not been for their ravages.

Oswego county can doubtless compare favorably with any other in the State in raising corn. It has repeatedly borne off the palm at the State exhibition.

The land devoted to wheat-growing is increasing; the yield, it is believed, will average twenty bushels to the acre. The spring varieties are principally used. The wheat midge is abroad, and injures the crop yearly, but has never entirely destroyed one, and rarely injures one seriously.

On the last day of the fair a very able, practical and well received address was delivered by the Hon. S. A. Law, before a larger audience than could get within sound of his voice.

The receipts, all of which were expended in fitting the grounds, paying premiums, &c., amounted to $1,550.

The annual meeting was held on the 20th day of October, at which the following officers were elected for the ensuing year:

President, Joel Turrill, of Oswego; Vice-President, John W. Pratt, of Fulton; Treasurer, Samuel G. Merriam, of New Haven; Recording Secretary, John U. Smith, Oswego Falls; Corresponding Secretary, R. K. Sanford, Fulton.

JOEL TURRILL, *President.*

January 31, 1859.

FAIR AT MEXICO.

The Oswego County Agricultural Society held its annual fair and cattle show upon the grounds belonging to the society, September 15, 16 and 17, 1858.

On the morning of the 15th the sun shone brightly, and save a south wind which prevailed for some days, the prospect was fair and encouraging. Before noon, it was apparent to all that the exhibition would exceed in extent and interest any fair ever before held in the county. The grounds were rapidly filled up with cattle, and sheep and swine were brought until it was found that previous preparations had been altogether inadequate for their accommodation. Pens were extemporized in haste, and all was life and bustle out of doors. Our excellent building, eighty-four feet by thirty-four in extent, was found much too small for the proper display of the great quantities of fruit and vegetables, and of the many and varied productions of the mothers and daughters, the farmers and the mechanics of the county. A careful revision of the entry books shows the exhibition to have been even more extensive than it was declared or supposed to be at the close of the fair. The total number of entries is now ascertained to be 1,055, of which the following are a portion: Of horses, there were entered for competition 120; cattle 115; sheep 59; swine 84; poultry 75; vegetables 99; fruit, aggregate by varieties 235.

The exhibition was also distinguished by the superior quality of the articles and animals displayed, as well as by their numbers. The show of blooded stock was especially good. The beautiful herd of Durhams entered by Mr. W. Marks, of Sandy Creek, formerly of Camillus, N. Y., attracted much attention, and the farmers of the county have great reason to con-

gratulate themselves upon the advent in their midst of this careful and skillful breeder of blooded stock.

Large delegations from town societies were present, bringing with them their premium animals for exhibition, and receiving upon them, in addition to the regular premiums, an extra one of one dollar each, as previously offered by the managers of the society. The receipts of this day fully equal those of any day in previous years.

At night it began and continued to rain, and the sun of the 16th rose upon a dark, cold, rainy, windy and cheerless morning. It seemed as if old sol had sent his equinoctial in advance with all its dreaded fury. Owners of cattle, sheep, swine and poultry, were excused and allowed to remove their stock. It was proposed by some to adjourn the fair to a more auspicious day. The committees upon all stock except horses had already made their examinations and were prepared to report. The horse show *could* be adjourned. The exhibitors of horses, however, many of them living it a distance, preferred that the show should continue, they therefore came forward, and unsolicited, generously and unanimously, offered to leave in the hands of the board, one-half of such premiums as might be awarded to them. (The success of the first and the third days was such that the board declined the generous offer, and refused to avail themselves of it. The orders for *all* premiums were drawn in *full* and *paid* as fast as presented.) The second day continued as it began, gloomy and discouraging. The rain poured incessantly. The receipts, which have usually been greatest upon this day, were only $17.60.

At night a meeting of those interested was held, for the discussion of agricultural topics. It was largely attended, and the participators seeming to forget the drenching rains and sorry plights of the day, entered into a spirited and interesting discussion. The subjects of fertilizers, underdraining and potato culture, each in turn received particular attention. The meeting was continued until a late hour, and adjourned to the last Wednesday in December, at which time the society has its annual meeting.

On the 17th there was less rain, though the winds were rough and cold. The exhibition of horses was continued with spirit, and all passed off pleasantly. A severe hail storm, though too late to be entered, being regarded as well timed, could not be excluded from a competition with the other storms, but was promptly met at its first charge with a formidable array of umbrellas, and was utterly unable to arrest the festivities.

The president's address, a sound and practical production, was well received and elicited much commendation. A more detailed notice of it cannot here be given. The address itself will be printed at a future day.

Among the noticeable features of the fair were the performances of a beautiful pair of trained oxen owned by the president, A. W. Severance, trained and exhibited by Mr. P. McLaughlin. We are accustomed to hear of the performances of trained elephants, monkeys, and horses, of the latter especially since the days of the renouned Rarey, and occasionally to witness their exploits, but we had not before regarded the ox as possessing

teachable intelligence, more than sufficient, at best, for a few evolutions without the restraints of the yoke. Never before had we seen oxen so subjected to the will of their master as to kneel at the word of command, to rise again simultaneously at a given signal, and to allow such familiarities of their driver, whether standing upon their backs or passing between their hind legs, taking up all their feet, sitting between their horns, or drawing with them a noisy band of music. These and many other things which we have not time to relate, were new, and rivited the attention of a vast throng. keeping them in attentive silence throughout the performance.

The display of fruit was, perhaps, the finest feature of the exhibition. Two hundred and thirty-five parcels of such beautiful apples, pears, peaches, plums and grapes, we ventnre to say have seldom been seen at any county fair, if they have at shows of large pretensions.

At the close of the exhibition the premiums were declared and paid as fast as called for.

The board congratulate themselves that the society has been the means of causing a greater advance in the improvement of stock, vegetable productions, and in agricultural progress generally, than has ever been made during any previous year; and they would again return thanks to the farmers and mechanics of the county, for the noble manner in which they have seconded their efforts in this direction, and for the renewed expression of their confidence, in coming forward and becoming members for the ensuing year, and though they cannot promise them exemption from storms, they can say that their permanent buildings will protect property from destruction by them.

At the close of the fair, the following resolution was offered and adopted:

Whereas, an esteemed member, the Vice-President, and a former President of this Society, Jarvis N. Dewey, has within the past few days been removed by death, following as it were the very footprints of one of our directors; and, whereas, by his energy and zeal for the advancement of agricultural interests he has rendered his name worthy of our respect and our grateful remembrance, be it

Resolved, That while the members of this society deeply mourn his death, they sympathize with his family and relatives in their bereavement, and direct that this resolution be published in the transactions of this society.

Mr. H. Palmer, to whom the first premium was awarded, gives the following statement of his process of making butter:

"Strain and set the milk in pans; time for cream to rise from twenty-four to forty-eight hours—season, temperature, etc., causing it to vary. Churn soon after skimming, temperature about 65 deg. Fahrenheit; rinse the butter with pure soft water, then salt, using about seven pounds to the one hundred of butter,—prefer pure ground rock salt; work in well and evenly with a lever worker, and put in packages well soaked in brine." Number of cows 20. Sample of butter manufactured in June.

The methods pursued by others being similar in material points, we do not publish them.

At the annual meeting, the first premium upon corn crop was awarded to J. Babcock, (see statement, ante p. 664.)

Officers for 1859.—O. R. Earl, President, Sandy Creek; T. H. Austin, Vice President, New Haven; A. Johnson, Secretary, Mexico; L. H. Conklin, Treasurer, Mexico.

Receipts from all sources,	$910 46
Expenditures,	869 06
Balance in treasury,	$41 40

L. H. CONKLIN, *Treasurer.*

OTSEGO.

The regular annual meeting of the Otsego County Agricultural Society, was held in the village of Cooperstown, on Wednesday and Thursday, Sept. 29th and 30th, 1858. The attendance was quite as large, and the interest manifested full as great as that of any former year. Experience has taught us that in order to maintain or increase our present prosperity, well inclosed grounds, convenient sheds and pens, and a track suitable for the exhibition of horses, are indispensable necessaries. With these, a liberal premium list, the rules of the society strictly adhered to and impartially adjudged, we may reasonably hope that the farmers of our county will not only feel the necessity of, but make every exertion in their power to sustain the society, by bringing forward their best products. It is only by competition and comparison that a man is able to judge of the defects of his own or the merits of another's animal. We often think our own the best till it is placed along side of another superior to it, and then we can readily see wherein the inferiority lies. The county of Otsego has within its borders, with the exception of one or two herds, as fine stock as that of any other county in the State. Short Horns, Herefords and Devons, with their grades, are scarcely equalled, certainly not surpassed by those of any other county. Of sheep, we have of Long Wools, the New Oxfords, Cotswolds and Leicesters; of Middle Wools, South Downs and Cheviots, a rare but valuable sheep, particularly in our county; and of Fine Wools, the French and Spanish Merinos, and of all their different crosses. Of swine, the improvement has been commensurate with those of other herds of animals. The Suffolk, the Essex, and the Berkshire, are rapidly, and we hope at no distant day, will entirely succeed that of the land sharks. It is scarcely necessary, and it might seem invidious, to go further and point out the particular herds and flocks which rank highest in our county, but every farmer of common observation must see the truth of the statement here made. I cannot close this short report without alluding to the noblest of animals, the horse, whose improvement within the last five or ten years has, to my observation at least, been quite as great, if not greater, than that of any other of the domestic animals among us. But a few years since the horses of our county were greatly excelled by those of many of the other counties in

the State. Now, thanks to many enterprising and judicious breeders of this useful class, Otsego has taken a stand which may with truth be said leaves it second to none. It does not require a poet's pen to write of our great staple, hops; here we excel, ranking all other counties in the Union, not only as to quantity but quality; fearing no competition, we leave all others behind. Their flocks, herds, and products of the soil, are among the blessings which the farmers of Otsego, by their patience and industry now enjoy, and will go on steadily increasing and improving, till to rank among its farmers, will be considered a position enviable by all.

ALFRED CLARKE, *President.*

PUTNAM.

I am glad to be able to report that the great interests of agriculture in Putnam county is progressing in a commendable degree, and the Society is prosperous, and its last annual fair in September was considered the best ever held in the county.

Our proximity to the city of New York, requires of our farmers to produce from their lands such articles as will secure a ready sale and the best prices. This has, and probably will, prevent us, but to a limited extent, from raising domestic animals. It is undoubtedly true that much more in this direction may profitably be done than has been.

The amount on hand at commencement of the year, ...	$254 83
Received the present year, ...	496 49
	$751 32
Amount expended this year, ...	565 22
	$186 10

LEONARD D. CLIFT, *President.*

Officers, 1859.—Chauncey R. Weeks, President, Carmel; Vice-Presidents, Jonathan Cole, Carmel; Samuel Kent, Patterson; Thatcher H. Theal, South East; Frederick P. James, Philipstown; Nathaniel Cole, Putnam Valley; Samuel A Townsend, Kent; Saxton Smith, Treasurer, Putnam Valley; G. Mortimer Belden, Secretary, Carmel.

QUEENS.

In reporting the transactions of the Queens County Agricultural Society, for the seventeenth year, we have great pleasure in stating that increasing prosperity has attended the labors of the past season.

Trial of Mowers.—Early in the season the directors invited manufacturers of mowing machines to participate in a trial of their respective merits on July 1st, 1859, the President and directors to act as judges. The lot selected was on the farm of Mr. Valentine Willis, about half a mile north of Mineola, covered with a heavy growth of timothy and clover. Each machine was to cut half an acre, with no assistance but the driver.

In the center of each half acre there was a rich hollow, where the grass was rank and thickest, and where its tangled condition was admirably calculated to test the power of each machine. Taking everything into consideration, no better and fairer field for a trial could have been selected.

Eight machines entered, viz.: Manny's, with Woods' and Jerome's improvement; Jerome's Combined Mower and Reaper, with steel plate guards; Jerome's Improved, with no plate on the guards; Nishwitz's Champion Mower; Weeks' Patent; Manny's Mower, by Ellison; Buckeye Mower; and Hicks' Machine.

A dynanometer, for testing the draft, unfortunately broke on the first trial, which prevented the committee reporting the draft of each machine. On the whole it was considered the best trial the Society had undertaken.

After closely examining each machine, and testing their various qualities, both as to work and usefulness to the farmer, combined with strength and durability, freedom from side draft, and least expenditure of power in operating, the committee decided to award the first premium to the "Buckeye Mower," second premium to "Jerome's Improved Combined Mower," with steel plate guards.

The work by all the machines was considered well done, but on raking the ground the two machines named had cut the cleanest swath.

Several hundred persons were present to witness the trial, and several machines were sold.

THE SEVENTEENTH ANNUAL EXHIBITION

Was held in the beautiful village of Flushing, on Wednesday, September 22d, on the grounds of Thomas Leggett, of which about twelve acres were surrounded by a high board fence, enclosing several tents, cattle stalls, and a well graded track for the exhibition of horses.

The unusual success this year resulted from the active and enterprising character of the local committee, who commenced their labors in good season, with a determination to have the arrangements in good taste and perfect. Many thanks are due to the citizens of Flushing, for contributing so liberally towards the greatly increased expenses, and especial praise was due to the ladies for the tastefully arranged and extensive display of flowers, evergreens and plants; to Mr. George C. Baker, of Flushing, for suggesting the tent arrangements, superintending the decorations, and collecting the necessary funds for local expenses.

The main tent, covering about 10,000 square feet of ground, was splendidly decorated; the main entrance festooned with evergreen wreaths and flags, and over it was a symbolical painting by Prof. Winter, representing the goddess of Plenty pouring out her supplies. Beneath was an inscription in evergreens as follows:

"Honor the Lord with thy substance, and with the first fruits of thy increase; so shall thy barns be filled with plenty."

The speaker's stand was tastefully decorated with evergreens, flags and flowers, in the center of which hung a well executed portrait of Gov. King, who was present as usual, both as an active participant in the exercises, and as an exhibitor of agricultural and horticultural products.

The day was cool and bracing, and unsurpassingly fine for the purpose.

"The Morning's blush was lifted up by Hope."

At 10 o'clock a procession was formed, consisting of a carriage drawn by fifty-six oxen, containing Shelton's splendid band of twenty performers. This was followed by carriages containing the orator of the day, the various committees, invited guests, &c., which marched through the principal streets of the village to the grounds.

Precisely at noon the Hon. David R. Floyd Jones, President of the society, was introduced to the audience by the vice-president, and delivered the annual address.

The speaker was highly applauded at the close of the address, and a copy solicited for publication. Gov. King, who was present on the platform, was called for, who, amid the cheering of the members, came forward and made a brief speech, in his own peculiar and happy manner, which was well received by a large and delighted audience. The speakers and invited guests were then escorted to Mayher's hotel, where a splendid repast was in waiting.

The number of entries were greatly in advance of any former occasion.

Cattle.—The exhibition of cattle was good, especially the grades, dairy cows and working oxen. Messrs. A. H. Mickle, G. Bradish and Allan Macdonald, of Flushing, and Thomas Messenger and Benjamin Wood, of North Hempstead, were the principal exhibitors. Thirty-seven premiums were awarded.

Horses.—The display of horses and brood mares was greater in number and better in quality, especially two and three year olds, than before shown at our fairs. Mr. Simon R. Brown, of Flushing, exhibited four horses which received first premiums, and one a second premium at the National Show at Springfield. Several fine colts of the get of Ethan Allen, were much admired. "Driving Cloud," shown by Benj. W. Strong, of Newtown, was disposed of shortly after the exhibition for $2,000. It was thought by numbers present that one of the finest travelers exhibited was "Lady Monarch," owned by Capt. M. Mouson, Astoria, but the judges did not agree with the spectators. Forty premiums were awarded to horses, including sixteen silver cups.

Sheep and Swine.—Thomas Messenger, of Clarence Hall, North Hempstead, exhibited his imported "Hampshire Downs;" these were procured at great expense from the best stock in Hampshire, England, where, from their superior size and constitution, they are fast displacing the South Downs. George Bradish, F. N. and James Lawrence, of Flushing, showed very fine middle and long wooled sheep. Messrs. Messenger, Mott, King and Macdonald were the successful exhibitors of swine.

Poultry.—The show of poultry was creditable. The Shanghais are fast disappearing, but an excellent cross has been obtained which has increased the size and laying qualities of our poultry.

Butter.—The quantity exhibited was small but of good quality, and

would compare very favorably with that of the best butter districts of the State. Most of our farmers who are of easy access to railroad, prefer sending their milk to New York. Mrs. Thomas L. Powell, and Miss Anne A. Lawrence, of Flushing, received first premiums.

Grain and Flour.—G. R. Underhill, of Oyster Bay, received the first premiums on winter wheat and flour. Some fine oats were shown by Thomas Messenger, and John A. King, Jr., of Great Neck. John B. Lott, of Flushing, the best rye and white corn.

Vegetables and Roots.—As might be expected from a county which so largely supplies New York, the show of vegetables were fine in quality. A. H. Mickle, of Flushing, made a display of sixty-one varieties of his own raising, and they were all good; some fine varieties were also shown by Allen MacDonald and Wm. Allen, with Gov. King. The single premiums were awarded to G. L. Willard and O. H. Gordon, of Cold Spring, T. Messenger, Great Neck, B. K. Duryea and James Lawrence, Flushing, and John S. Folk, Newtown. Some very fine Winningstadt cabbage from George Bradish, of Flushing, were highly commended.

Thirty-three premiums were awarded in this class.

Fruits.—The poorest display since the society organized. This was owing to the complete failure of the crop in this county. One of our officers who had forty-five acres of orchard, stated he did not think he should realize forty-five bushels of fruit from the whole. Of grapes grown under glass, the exhibition was fine, especially those of Jacob B. Boerum, and A. H. Mickle, of Flushing, Christopher Schweig, Ravenswood, and Wm. Allen, with Gov. King, Jamaica.

The Maizena and corn starch exhibited by the Glen Cove Starch Factory, was highly spoken of by those who had used it, and commended by the judges.

To the ladies much credit is due for the large display of their handy-work, from the simplest needle-work to the most elaborate embroidery. Miss Jane Lawrence, of Flushing, received a pair of silver butter knives for the best plain shirt.

Soon after 4 o'clock the secretary announced the premiums. The exercises and business of the day closed by the whole assembly joining in singing the doxology "Praise God from whom all blessings flow," &c., accompanied by the band. This was done with effect. It was a day highly enjoyed by the large concourse present.

The receipts and expenditures of the past year (1858) are as follows:

Balance on hand,	$365 97
Cash from inhabitants of Flushing,	736 46
" members' dues,	811 00
" receipts at entrance,	654 72
" State Treasurer,	91 00
	$2,659 15

Expenditures.

Cash paid for premiums,	$674 77
" fair expenses,	836 46
" printing and incidental expenses,	179 65
John Harold, secretary, cash disbursements,	54 53
	$1,745 41
Balance on hand,	$913 74

The net receipts are more than double those of last year.

The committee to audit the accounts reported that they had examined and compared the above account with the accompanying vouchers, and that the report was, in all respects, just and true.

The annual meeting of the society was held at the court house, on Monday, December 6, 1858, when the following officers were unanimously elected:

President, Hon. D. R. Floyd Jones; Vice-President, G. L. Willard; Secretary and Treasurer, John Harold; Directors, Robert Willets and Joseph Tompkins.

Several amendments were made to the constitution, and a vote of thanks passed to the president and secretary for their efficient services.

JOHN HAROLD, *Secretary.*

RENSSELAER.

Annual meeting at the Agricultural rooms, Troy, January 18, 1859.

The president, L. Chandler Ball, called the meeting to order.

H. W. Knickerbocker, treasurer, reported the following:

Whole amount of receipts since the last annual report,	$2,653 57
Amount expended, including premiums,	2,708 96
Balance due treasurer,	$44 38

The president then delivered the annual address which was responded to by John B. Tibbitts, Hon. Thomas B. Carroll, and Gen. J. J. Viele, after which the election was had, resulting in the re-election of L. Chandler Ball, President; H. W. Knickerbocker, Treasurer; J. C. Markham, Secretary; together with five Vice-presidents and eighteen Directors.

The meeting was well attended and much interest exhibited.

The society now occupies a spacious hall in Vail's block, corner of River and Congress streets, Troy, by the liberality of Mr. Geo. Vail, who donates the use of the room to the society, for its use as secretary's office, and in which the society have commenced the collection of a scientific and agricultural library and museum, and where the secretary has placed a free gallery of art, "constituting," as the Hon. Thos. Carroll justly observed, "an attractive home center for the friends of improvement;" and I would add, sending out into the beautiful country the refinements of literature,

science and art, redoubling the charms of rural life, and counteracting the disastrous tendency of our youth from the country to the city. How many thousands are to-day regretting their abandonment of the glorious country for the allurements of art which they now find might have been carried with them among their native hills and forests, rocks and rivers, thus creating all over the land, instead of neglected fields and ruined tenements, invaluable freehold estates and noble ancestral homes.

J. C. MARKHAM, *Secretary.*

REPORT.

The address delivered at the annual meeting, on the 18th of January, by the president of this society, seemed, upon its hearing, to present a view of the condition of the society which should not be withheld from the knowledge of *all* its members and supporters; to offer suggestions, moreover, which indicated that the affairs of the society had received from the president more than the usual attention, care and thought, expected from that official.

With the ordinary complimentary resolutions, and the ordinary publication of the address, so fitting an occasion for the work of self-examination, might have been got by, and the seed sown for another year prove to have been sown by the wayside. It occurred, however, to some who were present, to take steps, which prevent at least this result; and they were appointed a committee with others, to deliberate upon the address, and to make such report, as might, in their judgment, most thoroughly disseminate the suggestions it contains, and the announcement of the condition of the society it makes, throughout the county.

It now remains to be seen, whether the seed has fallen upon stony ground, where it *immediately* sprang up, because it had *no depth* of earth —or among thorns, which will *choke* it,—or upon good ground.

The committee have decided in the execution of their labors, to present, first, with but little comment, extracts from the address, comprising nearly the whole of it,—but arranged with reference to the *natural* order of the subjects, and then to submit briefly such views as have occurred to themselves.

The agricultural, manufacturing and general business character and capability of Rensselaer county are described in the following language; and as the statement of "what we *can* do" naturally precedes any other, we bring it first into notice:

"No county in the State can show more or higher evidences of prosperity than this. None can exhibit more gratifying results of human industry and skill, both in husbandry and in the mechanic arts, than this.

"Our sheep and cattle are known and sought for by the best breeders in the country; the finest woolen fabrics which the markets of the world afford, are produced from wool grown in this county. Our grain, of every kind—wheat, rye, corn, oats—is acknowledged by dealers to be the best they can procure; it is noted for its perfect maturity, high nutritive

qualities, and full standard weight. In fact, the soil of this district contains in greater abundance those ingredients upon which fertility depends, and as a natural consequence, vegetable and animal life, under skillful training, reach a higher degree of excellence.

"The skill of Trojan artists, and the great merit of Trojan manufactures, have long been conceded. Though other cities may be more noted for the production of a single article—Lowell for prints—Lynn for shoes, yet no city in the United States is so well and favorably known throughout the world, for the skill of its artists and the extent and variety of its manufactures, as the city of Troy."

A gratifying unanimity seems to exist in regard to the truth of this statement, and we think it will not easily be disturbed. The committee feel permitted to pass at once therefore to the PRESENT CONDITION of the society, which is announced as follows:

"The most important point, as regards the success of this institution, is the singular fact that it appears to have no strong hold upon the sympathy and good will of the people. The farmer, the manufacturer, the mechanic, the laborer—all those whose business may be increased, homes improved, condition elevated, by the means and influences which a popular association cannot fail to exert; seem to look upon this society with indifference, and they allow the fair ground, at the annual exhibition, to present a beggarly show of empty pens and stalls, and naked shelves and tables.

"Though the attendance at the last annual fair for the two first days was large, and the receipts, but for the storm with which it closed, were highly satisfactory, yet we cannot deny nor conceal the fact that the exhibition greatly disappoiated public expectation; it was small and meager, and entirely unworthy the intelligent and enterprising farmers and mechanics of Rensselaer county. Though some departments were well represented, especially the floral, which I think I never saw excelled, and though some articles and animals were of superior merit, yet, taken as a whole, as a representation of the skill, good taste, liberal habits, and improving condition of the people, it was, to say the least, discreditable.

"As indicative of the industrial character of the people, and the quantity and value of the products of the county, it was false and injurious. A stranger could not for a moment suppose that it represented one of the richest agricultural, and most extensive manufacturing districts in the State. Yet such is the fact."

This statement particularly refers to the last annual fair. It is known to be true however of many preceding fairs, and is so likely to be true of all, as to render their annual recurrence anticipated by the managers of the society with the most serious misgivings and apprehensions. Apprehensions only partially allayed by resorting to shifts to sustain appearances, and the treasury, such as are exposed and characterized by the address, as follows:

"To the refusal and neglect of farmers and mechanics to exhibit their stock and products, and the articles they manufacture, is owing the fact

that the officers of the society, in order to give some appearance of life and interest to the exhibitions, have been compelled, against their wishes and better judgment, to resort to means not connected with agriculture or the mechanic arts, and not legitimate objects of encouragement by this society.

"2.40 nags, not worth the drugs given them to produce their spasmodic efforts at speed; firemen's parades; female equestrianism; balloon ascensions; bearded women, and Ethiopian minstrels, have been resorted to, to draw a crowd and raise the receipts to a sum equal to the expenses and the premium list.

"These means doubtless produced the desired effect. They drew boys, idlers, and sportsmen within the gates, and made a temporary addition to the receipts which enabled the society to meet its engagements. That they have lowered the character, lessened the usefulness, and disgusted some of the best friends of the society, is certain. But the blame for this condition of things does not rest upon the officers of the society. They are justified in resorting to these means, when those which they relied upon were withheld. No; the blame rests upon the farmers, manufacturers and mechanics of the county who neglect to supply those legitimate attractions which their farms, gardens and shops contain; which, if freely presented and tastefully displayed, would not only furnish funds for all the uses of the society, but would fill the grounds and halls with pleased and gratified spectators—with men and women able to appreciate the uses and dignity of labor, and the goodness of God in clothing the earth with verdure, and filling the land with plenty."

These remarks can be followed with no better commentary than that furnished by the language of the address:

"If a fair is to be held at all, it should be the business of every man, woman and child in the county to make it successful; for every man, woman and child in the county are interested in the result. If it is successful, if it excites emulation, increases effort, developes genius, improves art, raises prices and increases trade, then all share in the benefit,—the whole district is elevated, advanced in character, reputation and influence, and opened to the streams of prosperity, which, like the rivers of Eden, beautify and fertilize the land. It is a failure, if it disappoints expectation, if it stifles inquiry, lessens competition, prevents effort, degrades art, lowers prices, and diminishes trade; then all suffer—the whole district is let down, lowered in character and reputation, and exposed to those evils of poverty and distress, which occasionally, like desolating tides, sweep over the country.

"But too many persons look upon the officers as theatrical managers, bound to perform according to the advertisement. They consider themselves as mere spectators, and look upon the show as got up for their amusement. If it falls short of their expectations, they sneer at the poverty of the exhibition, and condemn the men by whose time and money it has been produced. Farmers especially, do not hesitate to say, after

looking through the grounds, "H-u-m-p-h, poor show; we can beat this at home." Beat it at home! If you have articles of superior merit why are they left at home when the industry of the county is on exhibition, and people invited to come and see what wonders the toiling hands and working brains of old Rensselaer have produced?"

The censure conveyed in these remarks may perhaps with propriety be tempered by the reflections which the committee here interpose. If the Society is not a natural and manifest exponent of a popular idea and want, the people are not to blame for treating it with indifference. And if the Society is, as has been supposed, a legitimate creation and necessity of the agriculturalists, mechanics and manufacturers of the county; if, as stated in the address, it is a truth which only ignorance and obstinacy will dispute, that,

"Of all the means yet introduced for developing the resources of the country, for stimulating inquiry, for bringing out new and useful inventions, increasing the rewards of labor, and adding to the substantial wealth of the people, agricultural societies and annual fairs, with rooms for the permanent exhibition of improved implements, valuable seeds, and choice fruits and vegetables, have been most successful."

Yet conceding this, the fact that the people of the county have withheld their contributions and attendance from the annual fairs, does not necessarily inculpate them. There is room at least for an inquiry for other causes than those of indifference or neglect. It may be that the spirit of competition, to foster which has been the especial care of the society, and upon which it has chiefly sustained itself; it may be that this spirit, indulged of necessity, in regard to a limited number of articles, and circumscribed in its development, mainly by the territory of the county, has at length become torpid and all but extinct. It possibly may have happened too, in conducting the affairs of the society—in providing for its management—or in awarding its honors and favors, offence has been given, and that causes of estrangement exist, and may possibly have long existed in various sections of the county. Whether these two considerations alone have operated to bring the society into a state which justifies the language of the address, at all events, they may be deemed to have been sufficient to have done so, and it will be so assumed in the closing remarks of this committee. Before proceeding to which, however, we now insert the remaining portions of the address, which it is proposed to make use of in this report. The suggestions of the President, alluded to at the outset, are herein contained, and deserve to be carefully read and considered:

"I cannot assent to the declaration of our late worthy treasurer, that "the society is in a prosperous condition, and that all it asks, and all it needs, is efficient officers and a prudent management of its affairs." The question, as I view it, is not altogether a pecuniary one. The inquiry is not merely of attendance at the annual fair, but what class and character of people made up the attendance,—with what feelings and opinions did they view the exhibition,—what impression did they carry away of the in-

dustry of the county, and the intelligence, enterprise and skill of the people. The question is not of receipts only, but by what means were the receipts obtained.

"The question is not of entries alone, but to what class in the orders of merit do the entries belong; what improvement has been made; what new invention brought out; what new principle enunciated. The question is not of the ability of the society to sustain itself in fair weather, in genial air, and under bright skies, but whether it is so built upon the good will of the people, so united with the business interests of the district, so supported by the liberality, and guarded by the intelligence of its members, that when the rains come, and the floods beat upon it, it will stand unimpaired, an enduring monument of the wisdom of its founders.

"Until it can take and hold this position, until it can dispense in sunshine and in storm, its bounties and its blessings, it cannot be said to be in a prosperous condition, and to ask and need only efficient officers. It does ask and it does need a union of the business interests, and the earnest, willing, united efforts of all the business men of the county—farmers, manufacturers, mechanics, merchants,—not the half dozen liberal men in each class, who are always called upon, and who always give,—not these only, but the society asks and needs a spontaneous mass movement of the people to its support. The society does ask and it needs funds to obtain a library; to procure and distribute field and garden seeds; to introduce improved vegetables and fruits; to encourage experiments, and obtain essays on improved modes of tillage, and the growing, keeping and fattening of stock; to try and pronounce upon the comparative value of manures and fertilizers; to ascertain how noxious weeds may be exterminated, and injurious insects destroyed; to obtain accurate statistics of the business and resources of the county; to ascertain the exact cost of raising and preparing for market each and all the staple productions of the farm. Who can tell, with any weight of authority, the lowest remunerating price for a bushel of wheat, corn, oats, or a pound of beef, pork, or wool? Who knows when the annual surplus products of the county have been disposed of, whether the district is any richer for the toil and sweat of its 50,000 laborers? One may know perhaps whether his own business is profitable or otherwise; but who can tell whether the county is advancing in wealth and material prosperity or not? These are legitimate objects and inquiries for the attention of every agricultural society in the State, and no one can be declared prosperous that has not achieved success in some of these departments.

"I have said that the society needs a library of standard works on agriculture, and the arts connected therewith.

"The *science* of agriculture is of recent growth, and is almost entirely confined to books. I mean those experiments and examinations by which the nature of soils, the composition of plants and animals, and the laws of organic life were discovered, have been made by learned men in the laboratory and in the closet within the last few years, and the results are re-

corded in books which have not yet obtained general circulation. These books should be found upon the shelves of the society's rooms, where they can be examined and the facts they contain made available in improving the agriculture of the district. Other books, standard works upon any branch of natural science, the fine arts, history, and general literature, may be appropriately and profitably placed upon these shelves. Mighty is the influence of a good book; inestimable the value of a well chosen library. Gold of Ophir and gems of Golconda pale before the light that gleams from the pages whereon great truths and noble thoughts are written. Fill these shelves with choice books; hang these walls with trophies from the empire of Ceres and of Flora; spread this floor with models and designs of improved implements and machinery; fill this hall with the inventions of genius and the beautiful creations of art; and where can an hour, a day, be more pleasantly, more profitably spent than here.

"This is a truth which only ignorance and obstinacy will dispute, and I need not therefore offer proofs of so plain a proposition, but ask at once why this society is not more prosperous in its condition, and more successful in securing the objects for which it was instituted?

"Are the officers objectionable? Change them; elect those who will serve you better, and perform the duties more acceptably. Are the premiums unworthily bestowed? You are the judges, and award the prizes. Is the location of the fair objectionable? Change it—place it where the best interests and the permanent good of the society will be promoted. If any town offers to raise the amount necessary to purchase ground and erect suitable buildings and fixtures, examine, report upon, and if you please accept the proposition.

"If the migratory practice of the State Society meets your approval, let the town that desires to have the fair within its borders, give satisfactory bonds that all the ground, buildings, fixtures and fences which the society requires, shall be provided without charge or expense to the society. This is what the State society requires, and what the city in which the fair is held performs. Is any town or village prepared to make us such an offer, and secure its fulfilment? If so, I am sure it will be fairly considered. Do you desire to encourage town fairs? Do so; the wish is honorable, and your success, while it gratifies local pride, will be beneficial to the county and the State."

The fair and true conclusions from this address are, that the Rensselaer County Agricultural Society has ceased to awaken a natural and healthy interest in the mass of those for whose benefit it was instituted; and that the endeavors to continue its existence for the mere purpose of holding an annual show, the success ef which is doubtful, when even popular, but discreditable, expedients are resorted to, will avail only for a time; but that a new period of existence is before it, in which the custodianship of fair grounds, the management of fairs, and the awarding of premiums, will be the secondary and incidental objects of its care and labors; its new and higher duties, demanded by the requirement of its own growth, the advance

of knowledge and the improvemet of art; being to lead and stimulate the intellect, the agricultural mind, so to speak, of the county.

Adopting these conclusions, the question presents itself at once, shall the society enter upon this new era, or shall it prolong the old? If it is decided to undertake new and better things, let it be done carefully and with deliberation, as well as earnestly. The association is mainly composed of practical men, and is chiefly interested with the affairs of such men. Hence, whatever is undertaken or suggested, must be largely impressed with a practical character.

Re-union urged.—First, then, and as preliminary to other steps, the committee desire to urge the importance of a re-union of all sections of the county. As has been said in the address, town societies are not objectionable, but they are only *not* so if auxiliary to or in harmony with the county society. They are necessarily so, if independent of, and hostile to it. If they do so exist, the county society is no longer justly named. It is in fact but a sectional or town society itself. But the area of the entire county, its resources and capabilities, are certainly all required to contribute to, and sustain *one* respectable association. It certainly is apparent that if the county society, embracing still as it does by far the larger portion of the county in its membership and support, is necessitated to take measures to secure its permanence and continued usefulness; there is no town society but that would contribute to its own advancement by joining in the common movement, and thus catch the spirit which has awakened it. Let all causes of division then be inquired into and removed.

2d. Assuming that the society re-enlists in its support the entire county, or at least all sections that are not divided from its central point of meeting and operations by geographical barriers, the committee proceed to inquire, How are the suggestions advanced to be enforced? What are the new duties to be undertaken? In other words, what is meant by leading the agricultural mind, as we have called it. We answer—to undertake to supply the great want of that mind, which is an authoritative, recognized and common leadership. The society is, in theory, the common head of the agriculturists of the county; into it the teachings of science, the improvements of art, books and facts, experiments and plain thoughts, should all enter, be ruminated upon, and digested for the common good. It is unnatural and unreasonable to suppose that farmers generally will avail themselves of the improvements of the day, so long as those improvements are associated with the risk of experiment. Agriculture is not profitable enough to pay for experiment. Hence, the necessity of supplying carefully ascertained information as to new modes of culture, new varieties of seed, new implements, and all the new discoveries connected with the science of agriculture, in a form that at once draws the attention, commands the respect, and costs as little as possible. The Agricultural Association should do this for the farmer. To it he should contribute his quota of information derived from his observation and experience, and from its widely gathered contributions be enabled to stock

his mind with that concentrated and decisive knowledge which he knows so well how to appreciate. It may be a great loss to him to keep on another year and another year with the old horse power, cultivator, planter, harrow, thrasher, sheller, cutter or churn; but those who know anything of his profits will never reproach him for hesitating as he stands before the yearly increasing array of new implements. Let the association, where the common experience centers, by whom inventors should be heard, implements examined and exhibited, be enabled to settle these doubts, and decide for him. He may be suffering in an amount more than he annually makes, from a surplus of moisture in his soil. Tile draining is known to be the cheapest, the most durable, the best remedy by thousands, whom superior facilities, sources of information, and pecuniary ability have enabled to use them. But how long will the farmers of Rensselaer wait upon this well tried and demonstrated improvement, if the casual mention of isolated instances of its use and effects be all that reaches their ears. Let the association obtain and have ready, when called for, positive, accurate, minute information upon this subject. Let those who have tried it communicate to the common center what they know about it; what they have learnt of their own experience, vexation and loss, as well as from books and from others. Let the society have the benefit of their land to illustrate the improvement by, and be enabled to tell where tile are to be had, at what cost, which varieties should be used, &c., how laid, when best laid, how covered, and all similar information characterized by specificness, reliability and certainty. These or like observations might be continued in reference to manure, fruits, seeds, buildings and every other subject of the farmer's care and labor, which science and art seek to lighten and relieve. But the time of the committee will perhaps be better used in indicating some practical methods by which the society can attain and hold this position of leadership and confidence.

Society rooms.—It is obvious that there must be some common point of meeting. This is already provided in the rooms now occupied by the society. It is almost needless to say, that these rooms should be made attractive by accessibility, comfortableness and their general appearance. More than this, inducements should be held out to encourage the free and easy resort to them of all interested in the objects of the society. The standard books upon agriculture, horticulture, and landscape gardening, books of value relative to animals, for reference and for statistical information, should be gradually gathered into a library there. Journals, agricultural papers, and miscellaneous publications of interest, should be taken, collected and preserved. Implements should be kept on exhibition; and those which the society have, upon examination and trial and testimony decided to be superior, and the best of their kind, should be made known and commended. Of course there should always be present, as designed under existing arrangements, a person officially connected with the society, whose heart and mind are of the Col. Johnson type.

Monthly Meetings.—These rooms being established as the place of common resort; furnished with the attractions named, and others which would suggest themselves, or be suggested; the committee would further advise the holding, during the winter season, at least, of monthly meetings, for debate and consultation, after the plan of the meetings held by the Farmers' Club, of New York. For subjects of discussion, in the absence or in lieu of local or original topics, the reports of the New York meetings might be read, and then the debate commenced at the mouth of the Hudson, could be continued at its head. The wisdom of the "*Solons*" of agriculture might thus be carried out, and spread over the whole county during the winter, and prove, we doubt not, the "ne plus ultra" of fertilizers. In anticipation of these stated meetings, papers could be prepared by members of the society, or others invited to do so, upon the various special subjects heretofore alluded to, and familiar to the habits or wants of those before whom they would be thus brought. Conversational discussions might be thus drawn out from those whose tastes and acquirements are averse to labored and public displays, but who have often much to communicate as well as to learn. In this manner the society would be helped to realize the position claimed for it in preceding remarks, and become the central and authoritative point of information appertaining to the agricultural interests of the county.

Agricultural Journals.—But in no way, we think, can the society so effectually demonstrate its usefulness—so surely and truly lead the agricultural mind of the county, as by endorsing and sustaining a proper agricultural press. If, for instance, the "Country Gentleman" could be introduced to every farmer in the county—was suffered to be his teacher and counsellor—whose weekly visit was hailed as that of a traveled friend coming from a long journey, to tell him how the world moves, and what is doing in his line elsewhere, and where and when he may venture to draw out a little from the old tracks—the existence of the association would soon be involuntary and sustained without effort. A social necessity alone would then draw us together, and our common solicitude would be to extend the journeys, increase the learning, widen the observation, but hasten the pace, and quicken the return of our traveling friend.

If, as the only work of the next ten years, the society could successfully establish in the county, the ascendancy of a sound agricultural press, as sound as they know the one named to be, it would have done enough for its own continuance, and the influence of such a work would extend far beyond the field to which its operations were immediately limited. As a means of facilitating the practical application of this view of the committee, an annual subscription for the "Country Gentleman," and for other well known and approved periodicals, might be added to the premium list, and perhaps substituted with advantage in many cases for the publication of the Transactions of the State or county society.

Finally, the committee submit the following resolutions, in which they have endeavored to provide for the attainment of much of the substance and

the spirit of what has been already said; much, moreover, which they omit to say, from regard to the brevity which they desire should characterize this report, but which will suggest itself, they feel confident, to all whom they address:

1st. That a committee be appointed to confer with the citizens of the county at large, to bring to their particular knowledge the matter of the late proceedings in the society, to investigate especial causes of disaffection or estrangement, if such are found to exist; and, having communicated the present designs of the society, as set forth in the address and this report, to endeavor to enlist a cordial and general support of the society in the new era of its existence which it now enters upon.

Resolved, That a committee be appointed to give to the premium list, during the coming year, a careful and thorough revision, to report to the next annual meeting.

Resolved, That a committee be appointed to carry out and adopt, in the management of the society, the suggestions of the address and of this report, or such of them as, from time to time, they can introduce and practically realize.

J. B. TIBBITTS, *Chairman.*

ROCKLAND.

ANNUAL FAIR.

The elements were propitious. The sun shone brightly, and with the exception of the dust, every thing was favorable to the success of the annual exhibition of our county agricultural society.

The very fine display of stock on the first day, in addition to the other articles on exhibition, drew a large concourse from all parts of the county. The various premiums for cattle and horses were announced in the local papers. The exhibition of vegetables, while it afforded some fine specimens was not as extensive or varied as we had hoped to see. There were, as usual, beautiful specimens of needle-work, for which the fair competitors received premiums or commendation; among these were some rugwork by a little daughter of Isaac Sherwood of our village.

We also noticed a fine bay gelding belonging to Mr. Floyd, of New York city, driven by Mr. J. Jinnett, which has not been long enough in the county to enter for the premium, but trotted 2:54 to a wagon, and is a promising young horse.

There was more variety on the second day. The riding by ladies accompanied by gentlemen was graceful, and drew large numbers to the ground. Immediately after dinner was the trial of skill by the firemen of Nyack and Haverstraw, which resulted in favor of the Mazeppa company, No. 2, of Nyack.

The exercises connected with the annual address were introduced by a few words pertinent to the occasion by Hon. M. G. Leonard, president, followed with prayer by Rev. Mr. Smith, of Rockland Lake. Mr. Leonard

then introduced the orator of the day, R. Lexow, Esq., of whose address, which is to be published, it is sufficient to say at present, that it was well written, and received with attention and satisfaction by the large audience. A unanimous vote of thanks, with request of a copy for publication was given to Mr. Lexow.

Mr. Underhill, the guest of the day, as delegate from the Westchester county society, followed with some suggestions of great practical importance to our farmers.

Much credit is due to the efficient efforts of the president of the society, and those associated with him in its management, as also to the marshal of the day, for the success which attended this annual exhibition.

Our band, also, did themselves much credit, both by their fine appearance and the harmony of their music. We only regretted the interruption they caused the orator by marching upon the ground in full blast in the midst of his address. We presume they were not aware that he was speaking.

On the second day of the fair, previous to the fire department leaving our village, Mrs. Kreuder presented to Union company No. 2, through Joseph Chambers, a splendid and beautiful wreath, which our district attorney received in behalf of the company, and replied in a neat and appropriate address, which was listened to with great pleasure by all who heard it.

Officers for 1859.—President, Moses G. Leonard, Rockland Lake; Corresponding Secretary, A. Edward Suffern, Haverstraw; Recording Secretary, Spencer Wood, Clarkstown; Treasurer, Peter T. Stephens, Nyack. Executive committee, Isaac M. Dederer, Piermont; John E. Hogan Kamp, Clarkstown; John L. De Noyelles, Haverstraw; Stephen Johnson, Ramapo.

A. EDWARDS SUFFERN, *Cor. Sec'y.*

ST. LAWRENCE.

OGDENSBURGH, *January*, 25, 1859.

B. P. JOHNSON, Esq., *Secretary:*

Sir—The report of Mr. Miner, treasurer of the St. Lawrence County Agricultural Society, has doubtless reached the proper department before this. It shows, substantially, the sum brought over and the receipts of the year, at $2,400.00, and that the disbursements, for real estate, premiums and expenses of the fair, at about $2,300.00.

The annual fair was held at Canton, on the 15th, 16th, 17th and 18th of September. The weather was extremely unfavorable, or the receipts would doubtless have reached $3,000, and the meeting, though very large, would undoubtedly have exceeded all previous meetings of this society. The interest and attendance, of which you were once personally witness, do not seem to abate, and the society is in as flourishing and prosperous a condition as ever.

The society has purchased the grounds which it has occupied for so many years, and is making some substantial improvements.

The show of stock of all kinds, not only continues fine, but in my opinion, has improved very much in the last five years, and particularly horses.

For some unknown reason this year, the dairy product on exhibition was not of as fine quality as at some of our former shows. The exhibition of vegetables and grains was good. The crop of hay, vegetables and coarse grains, were spoken of by the farmers as quite up to the average yield.

We had an excellent address from the Hon. Mr. Law, of Delaware, who expressed himself highly pleased as to our exhibition.

H. G. FOOTE, *President.*

Officers.—Henry G. Foote, President, Ogdensburgh; L. E. B. Winslow, Secretary, Canton; Ebenezer Miner, Treasurer, Canton.

ST. LAWRENCE INTERNATIONAL AGRICULTURAL AND MECHANICAL SOCIETY.

The third annual fair was held upon the society's grounds, near the village of Ogdensburgh, on the 29th and 30th days of September, and the 1st day of October.

The attendance, as will appear from the treasurer's report herewith appended, was equal to any previous exhibition ever held in this section of the State.

At the State Fair, held at Watertown, in 1856, this society had a special delegation appointed for the purpose of learning, and if thought best, of adopting the same rules with regard to entrance upon the grounds, practiced by that society; for, at our first exhibition, at a previous day of the same autumn, we found a great evil arising from issuing family tickets. Frequently whole neighborhoods would be crowded into one wagon, representing but one family. Not content with this, they would pass the ticket through the fence, for others to come in after them.

In 1857, we adopted the plan of issuing ten coupons, which would admit each, one person. This rigid rule, of course, was the cause of much disaffection among that portion of each neighborhood, who practice the rule that "might makes right;" the officers necessarily had an arduous duty to quell this mutinous propensity of the boisterous few. But happily for the ultimate success of the society, we had no such difficulty the past season, although the same rule was enforced.

By the list of premiums paid, it will be observed that they were not confined to any particular locality, but cover a wide area of territory, (this argues well for the future,) embracing many enterprising individuals whose former proclivities have been with the old Society, organized and still held at Canton.

The Hon. David C. Judson, ex-president of that society, in his able report, published in vol. of Transactions for 1857, has given a valuable

reminiscence of St. Lawrence county, for the past half century. It is said that twenty years is the average period of each generation.

The first settlers of this forest region, were the backwoodsmen, whose catalogue of farming implements were the axe, hoe and hand spike. With the former, the majestic pine and the gigantic oak were felled to the earth, and their trunks drawn by cattle, were thrown into the waters of the "Queen of Rivers," whose name we adopt as our county cognomen, and from thence taken to the old world, there to be rejuvenized, and by the arts of man, made into floating arks, whose mission was to return to us thousands of old Europe's sons and daughters, borne down in their servitude by the privileged few, who commissioned the tax gatherer with unrelenting fury, to do their "dirty work," until endurance ceased to be a virtue; and with that heroism which conquers nations, bid adieu to scenes of childhood's memories, and cast their "little all" into the ark, which was to engulph them in the briny deep, or land them safe upon our shores, like helpless children, to learn the use of such tools as the settlers deemed necessary to erect their log cabins.

The privations of these early settlements gave to the next generation that hardihood of character for which St. Lawrence county yoemen are renowned.

Thus, step by step we have advanced, unaided by government patronage, until this county now produces more of the necessaries of life than any other in the State, and, judging from our last exhibition, few, if any, can compete with our domesticated animals of both native and imported breeds. The cultivation of fruit is yet in its infancy, yet the exhibition of apples, pears, peaches, grapes and plums, in quality, "can't be beat" in the State. The great evil of the past generation has been, that each one has tried to own and cultivate too much land, without striving to make each rod productive; but since we have commenced these annual holidays, the people are inquiring more for the best method of cultivation, and nothing could have been more timely than the able address of the Hon. Horace Greely, at our last fair, which was almost exclusively devoted to drainage.

The subject has been thought of, and talked of, but really practiced by none. There is a brick maker in this county, whose clay has been tested by moisture and frost, who is making arrangements to burn a kiln of 100,000 early in the spring, with which we can make the experiment at a price not exceeding twenty-five cents the rod.

The crop of hay, and all cereal grains on undrained lands, the past wet season, have proved a failure; not more than half the usual crop has been harvested.

The exhibition of cattle far exceeded that of any previous year; the Short Horns, Ayrshires and Devons were well represented.

The show of horses was good; the Black Hawk family were the most numerous.

In sheep and swine we could see an evident improvement.

In poultry all varieties known were represented in beautiful cages, built at great expense by the exhibitors.

In the mechanic arts our Mechanics' Hall, although materially enlarged, was not sufficient, and we were obliged to erect another building, and still another for musical instruments.

The agricultural warehouse was filled; the table arranged around its entire walls were loaded down with grain, seeds and vegetables, and the large platform in the center, and running through the entire building, was loaded with the products of the dairy, which in quality and flavor would place old Orange far in the shade.

We don't want Solon Robinson to teach us whether limestone, granite or sandstone is the *best food for cows!* But the white clover which grows spontaneous upon our limestone hills, will make butter, manufactured by our St. Lawrence county women, that will keep sweet and retain its flavor for twelve months or more. President Polk found that out, and while in the White House, at Washington, got his entire supply from this county.

Floral Hall was beautifully decorated, which is a circular tent, eighty feet in diameter, with pyramidal shelves in the center, filled with the choicest varieties of house plants, around which was a counter covered with fruit. About twenty feet from this was another circular table covered with domestic manufactures, and cases of the most valuable goods from merchants and manufacturers. Outside of these tables were put up bars, upon which were spread the patched-work quilts, counterpanes and needle-work generally.

Much credit is due to the farmers' wives and daughters who furnished the refreshment tables, and attended them during the whole of the week, with their carriages and attendants, at their own expense, and paid the entire receipts into the treasury of the society, and returned every dish and towel to their rightful owners, cleanly washed. Their meals, including coffee, tea and oysters, were sold at three shillings each, yet the amount paid over to the treasurer, exceeded the entire receipts from all sources of many of our county socities. May we not, therefore, ask for a special appropriation from the State, in aid of these our laudable endeavors?

Our receipts, as will appear from the treasurer's report, without any contributions, which we have had in former years, amounts to $2,284 91
And the amount paid for premiums and other expenses, have exceeded that amount, thus,..... 2,306 00

Due the treasurer,..... $21 09

A. P. MORSE, *President.*

CHAS. SHEPARD, *Secretary.*

William J. Averell, Treasurer, in account with St. Lawrence International, Agricultural and Mechanical Society:

1858.		*Dr.*
Aug. 2.	Treas. rec'd of R. Vilas, Esq., former Treasurer,	$132 34
	from sale of members' tickets,	564 07
	from sale of single tickets,	1,015 00
	from sale of track stand tickets,	175 22
	from sale of huckster's stands,	130 82
	from sale of ladies' refreshment saloon,	214 00
	from young ladies' sales ice cream, &c.,	46 76
	from G. F. Clark, am't overpaid on his orders,	2 42
Nov. 19.	from premium on Canada silver,	4 28
	Receipts as per cash book,	$2,284 91
		Cr.
Sept. 13.	By paid for general expenses,	$315 28
	police watchman, &c.,	203 38
	printing,	196 02
	carriage for ladies,	21 00
	lumber,	178 17
	race course stand,	230 00
	secretary's salary,	100 00
	annual address, Hon. H. Greeley,	50 00
	loss on counterfeit and broken bank bills,	7 65
Dec. 31.	premiums to date,	1,004 50
	Expenditures, as per cash book,	$2,306 00
	Balance due W. J. Averell, Treasurer,	$29 09

St. Lawrence county, ss.

William J. Averell, being duly sworn, doth depose and say, that the above account is just and true, according to his best knowledge and belief.

W. J. AVERELL.

Sworn and subscribed before me this 30th day of December, 1858.

ELIJAH WHITE, *Justice of the Peace.*

Resolved, That that the president and treasurer's Report be accepted and adopted, and that the secretary cause 1,000 copies of the same to be printed in pamphlet form, for the use of the society, as early as practicable.—*Adjourned.*

CHAS. SHEPARD, *Secretary.*

OGDENSBURGH, *January* 11, 1859.

Officers for 1859.—William B. Wheelock, Depeyster, President; Thos. L. Harison, Morley, 1st Vice-President; Abel A. Hall, Raymondville, 2d Vice-President; John E. Tallman, Oswegatchie, 3d Vice-President.

Directors.—Richard B. Chapman, Morristown, Charles A. Davies, Ogdensburgh, for three years; James G. Averell, John F. Rosseel, Ogdensburgh, for two years; H. S. Humphrey, Ogdensburgh, S. J. Dewey, Waddington, for 1 year.

WM. J. AVERELL, *Treasurer.*

CHAS. SHEPARD, *Secretary.*

SARATOGA.

In obedience to the requirements of the law ordering a report from the several county agricultural societies, I herewith present you a brief abstract of the proceedings of the Saratoga County Agricultural Society for the year 1858.

It has been in the main the most prosperous one ever known. The last fair of the term of ten years, located at Mechanicville, was held on the 7th, 8th and 9th days of September, and the interest elicited was much greater than ever before. The number of entries of articles for competition, was 868, whilst the greatest number at any previous fair was only 596. The receipts were as follows:

For exhibitors' tickets,	$223 00
For members' tickets, (not exhibitors,)	258 50
For single entrance fees to fair grounds,	232 24
Total receipts,	$713 74

It is truly gratifying to note the continued improvement in certain classes of articles exhibited, caused by the examples of some persons who have come forward, from year to year, and shown in those classes. Among these the most noteworthy are Seneca Daniels, Esq., of Milton, in the class of Devon cattle, and Mr. George Hennings, in garden vegetables. At the last fair Mr. Daniels' entries comprised nearly fifty head of cattle, of various kinds, oxen, bulls, cows, heifers, &c., and they were at all times an attractive feature of the exhibition. Mr. Daniels' is a young man, and has not extended his operations beyond our county yet, but should the State Fair come this way in a few years we should not be afraid of the stock he may exhibit in competition doing credit to our county.

Mr. Hennings, the exhibitor of garden vegetables, named, is a native of Germany, where he received a thorough education in his business, having served three years in the extensive gardens of the king of Prussia, at Potsdam, besides some time spent in a botanic garden.

He came to this country in the year 1850, and having heard of Saratoga as a thriving and fashionable watering place, conceived it would be a good place for the business of market gardening, so he came direct here without delaying in New York. He was not possessed of much capital at the start, and coming here entirely ignorant of our language, he was, for a few years, prevented from taking the place his skill and energy merited. At last, in the year 1855, Mr. P. Snyder, proprietor of a hotel here, was

induced to purchase a farm and put Mr. Hennings on it, as a tenant. Having thus got a foothold, he was soon capable of showing his talents in a way that attracted the attention of all lovers of good and early vegetables. He is always about the first to bring to market the vegetables so much sought after, and from the care used in getting up his load for market, his wagon has attractions that are hard to resist. His example has had quite an effect in inducing others to use more taste and care in putting up their products for market.

He made his first appearance at our fair in September, 1857. We had previously thought our show in his line pretty good, as there were some farmers among our exhibitors who took much pains about that portion of our show, but when he came upon the grounds with his load of stuff the old exhibitors acknowledged their defeat, and some declined bringing on their articles to compete. He took the first premiums, as a matter of course. In 1858, before the fair opened, the executive committee were waited upon and requested to make a separate class for the "Saratoga gardeners," or the farmers would not exhibit. Conceding the justice of their demands, we duplicated the premiums for greatest and best variety of garden vegetables, and thus increased the interest in that department very much, as well as gave better satisfaction to competitors. Mr. Hennings brought on his articles, left over after his successful business during the summer, and took his full share of premiums in competition for variety with another gardener, and for single articles in competition with all the other exhibitors.

Mr. Hennings is a good botanist, and it is always a pleasure to favor him with new seeds or cuttings sent the society for trial, as it is certain he will skillfully care for them and demonstrate whether they are fitted for cultivation in this climate, or are likely to prove a new or useful variety of vegetable already in cultivation here. It is, furthermore, worthy of note, that he never calls for a second supply of seed given him, but always takes care to raise a supply for himself from the first lot received. He is a general favorite with all, and his prosperity since he became the tenant of Mr. Snyder, is felt to be worthy of his skill and business capacity.

The officers of the Saratoga Agricultural Society, for the year 1859, are: President, Isaac Frink, of Milton, (post office, Ballston Spa); First Vice-President, Chauncey Boughton, Half Moon; Second Vice-President, Samuel Hoyt, Saratoga Springs; Corresponding Secretary, John A. Corey, Saratoga Springs; Recording Secretary, E. J. Huling, Saratoga Springs.

Respectfully submitted,

E. J. HULING, *Rec. Sec'y.*

SCHOHARIE.

The annual fair of the Schoharie County Agricultural Society for the year 1858, was held at the village of Middleburgh, on the 14th and 15th of October.

This, perhaps, was the largest fair ever held in the county, and conclu-

sively shows that there is an increasing interest in our agricultural department.

The various articles ordinarily brought out on such occasions were much more numerous than formerly, and of a much better quality.

A trotting match came off on the morning of the second day of the fair, between two fast nags owned by James Bouck, and Dr. Volney Danforth. After a spirited match, Mr. Bouck carried off the prize. This match created a great deal of interest, and drew a large crowd of spectators, it being something mostly novel in this county.

On Friday afternoon, a procession was formed, headed by the Middleburgh brass band, and moved to the Reformed Dutch Church, at which place George E. Danforth occupied the chair.

The meeting was opened by prayer by the Rev. Dr. Lintner, of Schoharie.

S. H. Mix delivered the address. It was an able, as well as practical address, and one which was well calculated to promote the agricultural interests of the county. It was listened to by a large and attentive audience.

Officers for 1859.—President, S. H. Mix; Vice-Presidents, George Manning, John Brown, Jacob Engle, Elijah Lawyer; Secretary, Hobart Krum; Treasurer, O. B. Throop; Executive Committee, Martin L. Shafer, Eli P. Gardner, Tobias Bouck, Smith Couch, A. Osterhout, Wm. L. Michaels, Hiram L. Schoolcraft.

The next annual fair will be held at the Schoharie Court House.

HOBART KRUM, *Sec'y.*

SCHUYLER.

It is a pleasing duty, attended with no ordinary feeling of gratification, that we make the fourth annual report of the Schuyler County Agricultural and Horticultural Society.

The past year has left the most cheering anticipation that the wants of our society have been met by an increased zeal and interest on the part of our members and the residents of the county.

The fourth annual fair of this society was held in the village of Watkins, on the society's grounds, on the 28th and 29th days of September. There was a very large number of animals entered for exhibition and competition, and the attendance of visitors was equal to the expectation of the officers of the society.

There were one hundred entries of horses, amongst which were several pair of very fine matched horses; also a large number of single horses which attracted much attention. The show of stallions was good, and among them was the Duroc horse, formerly from Newburgh, exhibited by William Crow, of Tyrone, which was also greatly admired by all.

The show of cattle was the best ever made by this society, there being seventy-three entries, comprising many of the best specimens of Durhams,

Devons and grades, ever exhibited in this county; thus proving to the satisfaction of all, the farmers of this county are fully aware of the benefits to be derived from the improvements that may be made in their cattle, as well as other kinds of stock.

There were fifteen competitors for the premiums offered for sheep, making forty-three entries and exhibiting over one hundred animals. The exhibition of this class of stock gave evidence that the farmers of the county have not neglected the improvement of this useful animal, as the specimens presented showed a marked improvement over the earlier exhibitions of this society.

There were a great variety of articles on exhibition at the large hall of the society, comprising almost every article of domestic and household productions, both useful and ornamental.

The annual address was delivered on the second day of the fair, by D. D. T. Moore, Esq., the able editor of the farmers' own paper, the "Rural New Yorker," which was listened to with marked attention by a very large auditory, under circumstances that clearly showed that they were equally gratified and interested. We have no doubt but this address has won for friend Moore, a host of warm friends and admirers in this county.

The show of fruit, considering the unfavorable season, was very good, both in quantity and quality. There were one hundred different varieties of apples, exhibited by three competitors; also many other fine specimens. There were some very fine pears, peaches and grapes on exhibition. We think the time is not far distant, (if not already,) when Schuyler will rank among the first counties in the State, for raising fruit.

Receipts.

Amount received from State,	$44 00
do for members,	353 00
do for tickets sold,	185 53
do for rent,	20 00
Total,	$602 53

Disbursements.

Paid for premiums,	$173 25
do improvements,	226 40
do expenses,	93 50
Total,	$493 15

Indebtedness of the society, $142. Received from State, twenty copies of Institute, and twenty copies of Transactions.

Officers for 1859.—President, Green Bennett, Dix; six Vice-Presidents, seven Managers, and an Executive Committee of seven; Thomas Evans, Watkins, Treasurer; S. N. Sackett, Catharine (Burdett P. O.), Secretary.

G B. THOMPSON, *President.*

ORLANDO HURD, *Secretary.*

WATKINS, *January* 6, 1859,

SENECA.

The annual fair and cattle show in Seneca county, was held at Farmerville, in the south-eastern part of the county, on the 13th, 14th and 15th of October, 1858. From the fact that it was held in the extreme south-east part of the county, there was reason to fear that it would not be as generally attended as the fairs of the county have usually been. The exhibition, too, was purely an agricultural one, and there were no inducements to influence any person to attend, which were not strictly of an agricultural character. It was, therefore, a matter of much satisfaction that the attendance was so general, and the receipts above what could reasonably have been anticipated.

The exhibition was a very fine one. The display of horses and cattle would have been very creditable to a much larger county. There were a very large number of the former entered, and many of them of rare excellence. Much attention is paid in this county to this class of stock, and our county fair, have been noted for the large number of excellent horses, embracing superior animals of almost every class. Altogether, the exhibition was a very creditable one, and very encouraging as to the future prospects of the society.

The annual meeting of the society, for the election of officers and the award of premiums on grain, roots, seeds, &c., was held at Waterloo, on the 21st of January, 1859. The treasurer made the following report of the receipts and expenditures for the year:

Receipts.

To balance in treasury at date of last report,	$503 28
members at $1 each,	562 00
tickets at 13 cts. each,	427 89
subscription raised at Farmerville previous to fair,	238 00
rent of refreshment tent,	25 00
cash from State of New York,	74 00
	$1,830 27

Expenditures.

Expenses and premiums for October fair, 1857, and winter meeting, 1858,	$128 37
Premiums at fair at Farmerville,	557 00
Expenses of fair at Farmerville,	690 12
Printing and tickets, &c., at fair,	100 00
Incidental expenses,	16 15
December 23, balance in treasurer's hands,	338 63
	$1,830 27

After the report of the treasurer had been read, the society proceeded to the choice of officers for the ensuing year. The following are the officers for the year:

President, Orrin Southwick; Vice-President, Truman Boardman; Treasurer, John D. Coe; Secretary, Charles Sentell; Directors, Ira Johnson, Lyman F. Crowell, John V. Grove, Michael Hoster, Joseph Wright.

CHARLES SENTELL, *Secretary.*

At the request of *one* of the parties whose farms were visited by the committee on farms, we publish the report of the committee:

REPORT OF THE COMMITTEE ON FARMS.

To the Board of Managers of the Seneca County Agricultural Society:

The committee on farms would respectfully report:

That there were but two farms offered in competition for the premiums offered by the society—that of Helim Sutton, in Romulus, and Abram Ditmars, in Covert.

In consequence of the remote situation of the members of the committee from each other, and the tardiness in the reception of the mail by some of its members, rendering prompt correspondence uncertain, it was impossible to obtain a full attendance, and on the day appointed but two of your committee were in attendance. This was very much regretted, but as the lateness of the day rendered further delay impracticable, and the uncertainty of fixing upon any day which would suit the convenience of all, the members present concluded to proceed with the task allotted them.

Before reporting progress, we would respectfully suggest, that the board of managers, in framing this committee hereafter, should so constitute it that the members thereof be located in more close communication with each other, either personally or by mail.

Your committee met on July 6th, at the residence of Helim Sutton, Esq., and proceeded to an examination of his farm. This farm comprises 218 acres, of which twenty acres is wood land. Soil principally clay, and underdrained. As this farm has heretofore been examined by several committees from the county agricultural society, and also by a committee from the State Agricultural Society, it is needless for us to give a description, as the same can be seen in the published "Transactions of New York State Agricultural Society."

We found two fields of barley, one of eighteen and the other of ten acres, in all twenty-eight acres, which we rated as good. A small patch of three-quarters acre winter barley, extra. Thirty-two acres oats, good. Mr. Sutton is in the habit of sowing about one-fifth barley with his oats, for the purpose of grinding his feed, a practice which your committee highly commend. We saw eight acres Mediterranean wheat, which looked well and rated best. Ten and one-half acres spring wheat, good. Thirty acres timothy and clover meadow, nothing more than ordinary. Twelve and one-half acres summer fallow, pretty much broken up. And what shall we say of the cornfield of some thirteen or fourteen acres? We found Mr. S. working his corn, and we must say that we thought him endowed with great courage, for the corn was so small and the color so bad, and it looked as if it had such a "hard road to travel," that it seemed to us that it had the

panic the worst kind, and if it survived the "crisis" it would be like a hopeless bankrupt, paying but a very small dividend. We could only sympathize with our friend, and give him all the condolence and hope we could wish for ourselves had we been in the same predicament. Not having since heard from "that cornfield," we hope the labor of our friend has not been in vain. The farm was in a good state of cultivation, and capable of producing good crops, as the luxuriant growth of thistles indicated, although some pains were taken to exterminate them and keep them down. Unfortunately for your committee, we were not refreshed with a sight of the beautiful *flower garden*, which the farm, at times, evidently seems to be, from the abundant specimens of wild mustard which we saw scattered over it, and which was at this time out of blow.

Your committee in reviewing Mr. Sutton's farm were fully impressed with the great amount of extra manual labor which his farm required, on account of the clay soil, and think him entitled to much commendation for the creditable manner in which it is managed.

July 7th, we visited the farm of Abram Ditmars, Esq., near Farmerville. This farm comprises 125 acres, of which twenty-five is wood-land. Black, gravelly soil, mixed with clay, underdrained, and rather easily worked. We found eleven acres oats, extra; three acres, good. Twelve acres corn, extra, and ten acres rated as best. Eighteen acres Mediterranean wheat, good. Ten acres clover meadow, all cut and mostly housed, which Mr. Ditmars informed us yielded some twenty-three or twenty-four tons. Your committee were fully satisfied that the yield was over two tons to the acre. We noticed an improvement in the barn yard, which was new to us, and which we cannot too highly commend to our brother farmers. It was a roofed straw-pen, twenty-six by thirty-six feet, seventeen feet posts, enclosed at the top, six feet below the eaves. The small cost of this out-building, and the great benefit in the saving of straw, and keeping it in bright, fresh condition for cattle, during the winter, the saving of labor in packing it, and in foddering out, make this a very important and useful arrangement, and one the economy, in every shape, of which is so great, that we think every farmer might, with great profit, imitate.

We found the manure yet in the barn yard. Mr. Ditmars informed us that he was, in a manner, compelled to leave it thus, as he had no place to put it until after harvest, when he intended to apply it to a stubble field, and plow it under for wheat. We think it would have been more profitable to have had it heaped up in the yard, and we cannot too highly condemn the practice of leaving it undone.

In regard to noxious weeds, we found great care had not only been used in their extermination, but also to prevent their getting a foothold. Canada thistles we saw none, except in one or two spots, where they had not yet been exterminated, and which we would probably not have seen had they not been pointed out to us by Mr. Ditmars himself. The fence corners and lane, were all free from them, and from all kinds of noxious

weeds; and, from appearance, no extra pains had been taken in anticipation of the visit of your committee, but it was evident that a part of the sytem of Mr. Ditmars' farming, is the extermination of all noxious weeds. In reviewing this farm, from the character of the soil, the cultivation is comparatively easy. The appearance of the crops indicated that Mr. Ditmars was a careful, energetic farmer, one who spares neither time nor labor in endeavoring to procure not only remunerating crops, but in keeping everything clean and neat.

In regard to the two farms examined the comparison is easy, as the difference was great Had there been no other farm offered, your committee would have, without hesitation, recommended the unanimous award of the first premium to Mr. Ditmars, as we think his farming, as well as his farm, entitled thereto.

The question arose whether Mr. Sutton was entitled to compete, he having been awarded a first premium by the county society, in a previous year. If this is the same society, only re-organized, he clearly is not entitled to compete. If it is a new society that has taken the place of the old one, then he is free to do so. This question we submit to the board of managers for their decision. It is one that should speedily be settled, in order that your committee may act without any embarrassment in the matter hereafter. As Mr Sutton has all the honors attached to once having taken the first premium, and in consideration of this question, knowing his generous nature, and his character as a public spirited citizen, we make no recommendation in relation to second premium, as we are confident that it is not for "filthy lucre," but the appreciation of his public spirit, together with the honors, if entitled to it, attached to bearing off the palm of victory.

We would respectfully conclude, by offering the following:

Resolved, That the board of managers of the Seneca County Agricultural Society, award to Abram Ditmars, Esq., of Covert, the first premium, of ten dollars, in money or in plate, and diploma for the best managed farm.

All of which is respectfully submitted.

GEO. S. CONOVER,
JOHN J. COVERT,
Committee on Farms.

SENECA COUNTY, *October*, 1858.

STEUBEN.

B. P. JOHNSON, ESQ.:

Dear Sir—The sixth annual fair of the Steuben County Agricultural Society, was held at Bath, September 23d and 24th, 1858. It fully realized the expectations of its friends, who had determined to make the exhibition a worthy exponent of the thrift and industry of the county.

The farm and the fireside, the studio of the artist and the shop of the artizan, the flower, the fruit, and the kitchen garden, were alike honored by their representative products. The old routine of the farmer is fast passing away, and silently, as it were in the watches of the night, science and art are guiding him on, swiftly, to better things. To the agriculturist, *true* at heart, it is a pleasure and a *sign*, to see each year a growing desire to graze only the improved breeds of stock, to employ the better implements which art, each year, is giving us, and, better still, to follow the higher methods which science points out to us, for the daily management of our farms. A few years since, many regarded it as opprobrium to be called a "book farmer." Now, the rule is reversed; and all, manfully, earnestly as we may, are striving to become more worthy of that title of honor. Young America finds need of a broader mental development than is implied in the ability to read, to write, and cypher, and which, some years since, was deemed all sufficient for the purposes of the farmer. The young farmers of this country, are to-day struggling heroically toward the high point achieved by Berkeley, of whom it was said, "he has intermeddled with all knowledge," so vast and varied were his mental acquirements. The farmer's life, after all, with its various details and duties, is that of a student. Its *true* qalifications are the broadest of all the professions, for it includes a knowledge of every science, and the application of all art—its realization, the grandest of which we can conceive, opening, as it does, the vast arcana of nature, which includes religion, as well as poetry. Ere many generations shall have passed, they will be regarded as the truly educated class in our country.

The address was delivered by Major A. B. Dickinson, and the marked attention of the large number present, evinced the interest felt in his able and *practical* address. Unlike most speakers at fairs, he left theory at home for that day, and gave us plain facts—sometimes startling, it is true, but facts still, which men, and women too, go home and canvass, and think over, and resolve to put in practice there.

The display of horses was pronounced, by those best able to judge, as most creditable to the county. The Black Hawk stock, especially, attracted much attention, and was a decided feature of the fair.

In short horns, the exhibition was better and larger than at any previous fair, including imported cattle, and grades, which would have shown well anywhere. Devons and Ayreshires, were also well represented, in quality and numbers. The luxuriant pastures of Steuben county are fast thrusting aside, as unworthy of them, the "scrubs" of a former time, and replacing these with the various improved breeds of cattle and sheep.

A large number of long and middle-wooled sheep were entered for competition. The committee on fine wooled sheep, "make the award with great diffidence. Among so many sheep, all of them good, and the great majority of superior excellence, it is impossible for your committtee, or for *any committee*, to so discriminate as to render a just and accurate award. But with this admission, they beg to say that they have aimed ta act with-

out bias or favor. A better exhibition of sheep, in all the characteristics that go to make up first class animals, they do not desire to see; and in behalf of Steuben county, they proudly challenge any other county in this or in any other State, to make a better display."

The exhibition of cereals was large. But few samples of butter were offered, but their appearance indicated an improvement in the manufacture, as compared with former exhibitions. The samples of cheese were very choice, requiring close examination to discriminate between their qualities.

In the several departments comprising domestic manufactures, the ladies, as usual, contributed generously. The many articles of delicate embroidery, and the sterner products of the wheel and loom, evinced the most commendable taste, industry and skill. We acknowledge with pleasure our indebtedness to a lady of a southerly town, whose flower garden annually, under the guidance of the most cultivated and refined taste, contributes with commendable generosity to the amateur department of our exhibitions.

The display of fruit was quite large, and in variety and quality would have done honor to those counties which, with better reason than our own, are classed as fruit growing counties. The pears especially were very fine, and reflected credit upon the taste and enterprise of the exhibitors. Yet in this class the luscious products of the *vine* attracted the greatest attention. The Isabella and Catawba and Hamburgh were perfect in beauty and ripeness, though we doubt not that many a lip, unable to reach them behind their screens of glass, turned away and pronounced them "sour." During the last two years much attention has been given to the growing of the vine. In Urbana vineyards have been extensively planted, and "The Vine Growers' Association" formed, composed of gentlemen able and determined to prove that this can be added to the number of *paying* agricultural enterprises.

The yield of winter wheat the past season would not, we think, exceed an average of more than eight bushels per acre, and of very inferior quality. The midge and the rust did not leave their errand of destruction half done. A large area in wheat was left uncut. Much was gathered which would not pay the expense of thrashing. Yet in some localities, and generally on the higher lands, heavy crops were secured uninjured by either cause mentioned. The spring wheat crop was generally good, though it also suffered to some extent from the effects of rust and the ravages of the midge. The crop of Indian corn was unusually fine, and ripened perfectly, both on hill and valley farms. Average yield, forty bushels. Average yield on valley lands, 90 to 100 bushels. Barley, oats and buckwheat were each very light—50 per cent lighter than usual—caused by the injury of insects and excessively dry weather at the period of formation of the berry. The potato crop was excellent for the times, escaping the casualties of disease, and filling our bins with plenty. The hay crop, first in importance, though the least regarded, was much below an average, caused mainly by the ravages of the wire worm.

Receipts from various sources,	$1,247 41
Payments,	1,055 90
Cash balance on hand,	$191 51

Officers for 1859.—President, Daniel Gray, Wheeler; Treasurer, Reuben Robie, Bath; Secretary, Robert M. Lyon, Bath; and seven Vice-Presidents.

LYMAN BALCOM, *President.*

ROBERT M. LYON, *Secretary.*

SULLIVAN.

Below is a list of the officers of the Sullivan County Agricultural Society, for the year 1859:

President, John D. O'Neill, of Fallsburgh; Recording Secretary, James L. Stewart, Monticello; Corresponding Secretary, James E, Quinlan, Monticello; Treasurer, James H. Foster, Monticello.

JAMES E. QUINLAN, *Cor. Secretary.*

TIOGA.

The annual fair of the Tioga County Agricultural Society, was held in the village of Owego, Sept. 28, 29 and 30—three days of as beautiful weather as the great Ruler of the Universe often blesses us with. Our show was a most perfect success, and everbody went home satisfied.

Our grounds are in an admirable location, being an enclosure of eight acres, with shade trees interspersed over a part of the plot. We have an excellent track, one-third of a mile round, on which our farmers and sportsmen show their fine horses; and this branch of our exhibition is not neglected. About one-third of the back part of our grounds is a gradual rise, making a beautiful spot for our hall and buildings for the exhibition of mechanical implements, vegetables, etc., overlooking the flat below where our track and cattle stalls are located. Our buildings are but temporary, as yet, we being only in our infancy. This is the second year of our occupancy of this lot, having a lease of it for five years. We are in hopes, before the expiration of our lease, to be able to buy the lot and ereet permanent buildings. Our prospects are good, and if our farmer friends will but take hold of the matter, and become interested in the work, as they should, we must succeed.

Our cause is a good one, and our county can, if she will, compete with any of her sister counties in the State; our chances for raising corn, oats, rye, buckwheat and potatoes, are as good as any county in the State.

We have but very little manufacturing interest in this county.

Horses.—Our exhibition of horses was very fine, never having been excelled at any previous exhibition. Young Almack, owned by F. M. Wilcox, Owego, took the first premium of eight dollars, as the best stallion—and a good one he is. The exhibition of this class of horses, was

very superior, being conclusive evidence of the improvement in the breed of horses.

We had a very fine show of matched and single horses, and a large number of entries of work horses; probably as fine a display as any other county in the State can produce. In fact, this part of our show was all we could ask, and more than we had reason to expect. This part of our exhibition will take care of itself. If we can only bring our farmers up to their duty in cattle, sheep and swine, then, and not till then, may we look for a useful and interesting show to the farmer.

Cattle.—Our exhibition of cattle was not what we had reason to expect it would be. Our farmers said it was owing to a very bad season for pasturage. The season had been so dry, that the stock all looked bad, and they dared not bring it out for fear of being laughed at. The stock on exhibition, consisted of Durhams, Devons, Herefords and natives; all of which were good, and show an improvement in our stock growing. We had from fifteen to twenty pairs of as good working oxen as any county need to have. They were all of the native breed.

Sheep.—We are not much of a wool-growing people. What we have, are mostly common breed. We have a few flocks of French merino, Southdowns and Cotswold, owned by some of our best farmers; but none that will come up to Patterson's, of Chautauque county.

Swine.—There is not attention enough paid to raising swine, or improving what we do raise. We have a few Suffolks and Essex, crossed with natives, that are doing well, and make good porkers. Our exhibition was very fairly represented in this line.

Mechanical.—We are improving in our agricultural implements, and quite keeping up with the times. Mowers, reapers and thrashers, are all the rage now, with our farmers that are able to get them.

Domestic.—This department was very finely represented by the handiwork of our farmers' wives and daughters.

Plowing Match.—This interesting part of our exhibition took place the third day of our fair, at nine o'clock, A. M. We had a large number of people to witness the strife, and it passed off very pleasantly, and much to the satisfaction of all interested.

We also had a trial of speed for some of our trotting nags, the third, and last, day, with *ladies riding and driving*, which called out a vast concourse of people, there being over five thousand persons on the grounds during the day. All passed off well, and without accident, satisfying the most that were present; so that we feel highly gratified with the success of our institution.

Below I send you the receipts and expenditures for the current year:

The first day of our fair I received $300.59, including 260 memberships, the balance for sale of admission tickets, ...	$300 59
2d day, admission fees only, ...	283 32
Carried forward, ...	$583 91

Brought forward,	$583 91
3d day, admission fees only,	251 70
Received from State,	61 00
Refreshment stands, rent of ground, &c.,	80 00
Premiums awarded not paid, and extra tickets,	16 45
Total,	$993 06

Paid out,	rent of ground,	$120 00
do	debt of last year,	235 50
do	premiums awarded,	378 00
do	bill of lumber,	66 80
do	printing bills for the year,	97 75
do	watchmen, police, gate-keepers, &c.,	75 00
do	hay, feed, ribbons for judges, water, &c.,	20 01
do	moving building, and general work on the ground before the fair,	60 00
Total,		$1,053 06

Leaving a debt of sixty dollars against the society, to be paid another year, if our lives are spared.

All of which is respectfully submitted.

THOS. J. CHATFIELD, *Treasurer.*

OWEGO, TIOGA Co., N. Y., *Oct.* 1, 1858.

TOMPKINS.

The county of Tompkins, with a population of 31,516, two-thirds of which are engaged in agricultural pursuits, with a varying altitude of about 1,200 feet from a level of Cayuga Lake to the summit of our hills, in latitude 42 deg. 30 min. north, and longitude 0 deg. 30 min. east from Washington, contains 390,579 acres of land, of which 205,616 acres are improved.

The surface of the county is uneven, with narrow belts of alluvial soil bordering the streams in the valleys, the balance varying from the gently inclining slopes of the upper plains, to the more rugged sides of our everlasting hills. The underlaying rock is principally calciferous slate, with an outcropping strata of limestone, near the boundary of the county.

Thus situated, we have a soil and climate as variable as any in the state, and our products are alike diversified.

CROPS.

Wheat was regarded as a staple of our county twenty years ago, but the exhausting system of culture pursued by our farmers, and the ravages of the insect, has reduced the annual product of wheat, until it is no longer a remunerative crop. From an annual product of half a million of bushels

twenty years ago, we don't now produce more than 100,000 bushels, of all varieties.

The ravages of the midge appears to be on the wane, and improvements in our agriculture may again restore the wheat culture as a profitable crop. I estimate the average product per acre at not more than 12 bushels, at the present time, either of the winter or spring varieties.

Rye is not extensively cultivated in this county, and the average product does not exceed, I think, 10 bushels per acre. I attribute this low average yield to the practice of sowing rye on the poorest ground we have, as a crop to seed with. To exhaust the land by the culture of barley and oats, then sow rye and seed down, seems to be the favorite practice. The product of the county for the year 1858, was probably about 15,000 bushels.

Corn is our most important grain crop, and is being better appreciated by our farmers. The season of 1858 was a very favorable one for the growth of corn, and the crop was good. I feel warranted in placing the average yield at 35 bushels per acre through the county, and the total product at 500,000 bushels corn, and 40,000 tons of fodder.

The varieties mostly cultivated are an early eight-rowed yellow, and eight-rowed white. The Dutton is still in existence among us, but its small kernel and large cob, has prevented its becoming popular, though more productive than any other variety. The King Philip and Skenandoah varieties are gaining favor with our farmers. Sowing corn broad-cast for the use of dairy stock when the pastures fail by drouth, is finding favor among us, and our dairymen are thus enabled to keep up the standard quality of their butter and cheese, and to increase the quantity. The production of corn has doubled in ten years in this county.

Barley is cultivated to some extent among us, but I think with less favor than formerly. The crop does not probably exceed 45,000 or 50,000 bushels, with an average per acre of 14 or 15 bushels.

Oats have been a popular crop in this county since the failure of our wheat, and has been in a measure substituted as a money producing crop. I think the mode of culture adopted for oats has an exhausting tendency, and it is pursuing the system of deterioration which was begun under our wheat culture. The gross products of the county probably exceeds a million of bushels, though I shall not put the average product at more than 20 bushels per acre. The product of this crop in our county has doubled in ten years.

Buckwheat is cultivated among us as a kind of necessity crop,—put upon ground where nothing else will grow, where there is some foul weed to be stifled out, or where there was not time to prepare for an earlier crop. The result is a low average yield per acre of probably not more than eight bushels, and 75,000 to 100,000 bushels as the total product of the county.

Peas have been less cultivated of late than formerly, when they were a favorite crop to precede wheat. This may be owing to the failure of the wheat crop in part, and the ravages of the pea bug in part. I will here suggest that the pea bug may be got rid of by a concerted movement to

skip the pea culture one or two years, and then begin again with seed that has been kept over a year, from which the bug has escaped. The entire product of the county does not exceed five or six thousand bushels, or not more than one quarter of what it was ten years ago, and the average per acre less than twenty bushels.

Beans are not as generally cultivated as they might profitably be. They seem only to be thought of when we have ground too poor for other crops. They are easily cultivated and command fair prices. Two or three thousand bushels is the full annual product, with an average of a dozen bushels per acre.

Potatoes though frequently failing from the rot, are extensively cultivated among us, for the want of a convenient substitute to supply their place at the table, and I feel confident that our farmers are improving in their knowledge of the difficulty that attends the potatoe culture, and less frequently fail to secure fair crops than they did a few years ago. With a compost of six cords horse manure, ten bushels ashes, three bushels gypsum and one hundred pounds salt for an acre, manured in the hill, upon sod ground, I have succeeded in getting good and healthy crops of potatoes. The crop of the last year may be placed at about 150,000 bushels, at an average of 75 bushels per acre. The product of potatoes has fallen off one-half in ten years.

Roots of various kinds are grown in very limited quantities. They are esteemed as a spring food for stock, but thought to require too much hand labor in their culture to be profitable.

Hay.—The crop was a full average one, and the favorable season for harvesting it produced an article of general good quality. The entire crop may be safely estimated at 50,000 tons, averaging one and a quarter tons per acre.

Hungarian Grass.—This variety of millet was introduced in our county last spring, with seed direct from Iowa. Several acres were sown on light land from June 15th to July 1st, upon which oats were grown the two previous years. The product was two tons hay per acre. The hay after being thrashed was eaten freely by all kinds of stock. It seems likely to prove a valuable addition to our hay producing grasses.

Fruit.—The attention requisite for continued success in fruit culture is wanting among our farmers. Most of them have reared up orchards on their farms that were productive of the finest fruit in by gone years, but the destroyer has come, and the farmer neglects to defend the product of his patient toil from its multifarious attacks, and the orchard falls a prey to the borer, the bark-louse, the caterpillar, and their hosts of confederates, till it is a rare thing to find a sound apple in our markets, and but a limited supply of the defective fruit. The plum has almost entirely disappeared, amid the ravages of the curculio, and the peach is now the prey of that destructive insect, while the apricot and nectarine is scarcely thought of. The cherry has not escaped the attention of the destroyers, and a *sound* cherry would almost be a curiosity. The quince is sickly and

worm-eaten, and presents a beggarly appearance in contrast with its former golden beauty. The pear is more favored, and seems to be beset with fewer enemies, and is eliciting a large share of attention. The dwarf pear culture has many friends in our county, and is likely to be fully tested. Grapes do well on our lowest altitudes. The Isabella does not always fully mature, and our attention is being turned to earlier varieties.

Dairying.—The dairying of the county is mostly confined to butter making, and some of our dairies have acquired a high reputation in market, commanding from 10 to 15 per cent higher prices than the average. The average product of butter of seven of the best dairies, of which I have an account, is 144 lbs. per cow, the highest of the seven being 186 lbs. per cow, and the lowest 130 lbs. per cow. This however must be above the average of the whole county, which the census shows to have been 102 lbs. per cow in 1845, 109 lbs. per cow in 1850, and 113 lbs. per cow in 1855. It is my opinion that the standard of our dairy cows is improving, and that it is a safe estimate to place the average product of all our dairies at 120 lbs. per cow. Corn sown broadcast, to be cut for the dairy cows, when the supply of grass fails in August and September, is found to be beneficial in keeping up the quantity and quality of the butter to a very uniform standard through the season. Some of our dairymen have fed meal to their cows during the butter season, which they find improves the quality of their butter more than it does the quantity, and they have to look for remuneration in an increased price for their butter. The product of the county for the past year may be estimated at about 1,747,000 lbs. Cheese is not extensively made in this county, though we have a few good cheese dairies that average 500 lbs. per cow. The annual product probably reaches 75,000 lbs., which is much less than it was ten years ago.

DOMESTIC ANIMALS.

Horses.—Most of our farmers concede that our horses are not as good as they should be, and a general desire to improve is apparent; but there is much difference of opinion as to the best blood for improving our present stock of horses. This subject is likely to command increased attention, and it is hoped will result in substantial improvements in this noblest of all animals. The present stock of our county numbers about 11,000.

Cattle.—The spirit of improvement is manifesting itself in this branch of our husbandry, both in the increase of numbers and improvement in the quality. Sixteen thorough-bred Short Horn bulls, and five or six thorough-bred Devon bulls were bred to the cows of the county during the past season, and two-thirds of that number had been thus used the season previous, thus a large number of our young animals are of a superior quality, and we are looking forward for a marked improvement in our dairy cows, as we find the best milkers and butter makers we have in the county, are cows sired by thorough-bred Short Horned bulls, out of our best native

milkers. It seems to be a cross well adapted to dairy purposes, and produces an animal much more valuable for the butcher, after they cease to be of service in the dairy. The Devon cross also produces a favorite cow for hilly districts, and the finest working oxen that we have. If the increase of our stock has continued in the same ratio since 1855 that it did during the previous five years, we now have about 15,724 cows, 16,000 young cattle, and 1,500 oxen.

Sheep have received less attention from our farmers than in former years, though we have still many fine flocks in the county, some that would compare favorably with the best in the State. The number of our sheep has fallen off for several years past and probably does not now exceed 50,000, and the product of wool 150,000 lbs.

Swine is receiving more attention than for a few years past, and early maturing varieties suitable for furnishing the New York market with light pork, have been much sought for. The annual product I estimate at 20,000 hogs.

Poultry.—The mania for "Shanghais" and "Burramfooters" has subsided, and the pedigrees of chickens are no longer regarded as essential, but the hen fever has not been unproductive of good. It has left us with a grade stock of fowls larger and more valuable than we formerly possessed, the product of which deserve a passing word. The shipment of poultry to New York during the past year has amounted to 300 tons, and the consumption of the home market I estimate at 200 tons, averaging inclusive of turkeys, about seven cents per pound, amounting to $70,000, to which must be added at least $30,000 for the year's crop of eggs sent to market, making a total of $100,000 as the annual product of the poultry crop of the county.

THE FARM.

Improvements in the farm and farm buildings keep pace with those in crops and stock.

The improvements in the dwellings of our rural population are so marked as to be apparent to the most casual observer, and has added much to the beauty of the farm and the convenience and comfort of the farmer and his family.

The proper drainage of farms is also receiving the attention it deserves, and many fields may be seen producing fine crops, with the water silently crossing through under-drains beneath their surface, that formerly saturated their soil and produced sterility. This improvement is so apparent that much capital and labor will be expended in its prosecution.

THE SOCIETY.

The Tompkins County Agricultural and Horticultural Society was first organized on the 12th of February, 1840, and has pursued the even tenor of its way till the present time, with the exception of a year or two, when the bitter waters of political strife seemed to drown out the crop of harmony and good fellowship requisite for sustaining the interest and dignity

of the agricultural cause. Thorough underdrainage, however, speedily relieved the soil of this corroding influence, and placed it in condition for a more fruitful yield, and a richer harvest than had previously attended the efforts of the society, and at the present time the desire for improvement burns brighter and with a greater intensity than at any former period of the last twenty years. This desire is developing itself in the organization of Town Societies and Farmers' Clubs in several towns in the county, and with proper fostering, we hope to see it extend to an effective organization in every school district.

Independent of our county organization, Ithaca has a farmers' club, recently organized, the members of which meet one evening in each week to discuss subjects relating to their profession. They have already accumulated a library of about 300 volumes of agricultural and mechanical works. Their reading room is kept open and warmed daily, for the use of all who choose to visit it, in which there is a dozen of the agricultural journals of the day and the principal daily papers of New York. This club will be of great value to the agricultural interests of the county, by the collection and diffusion of knowledge, seeds and specimens among their brethren of the county.

Dryden has a town society organized and in a flourishing condition, holding annual fairs that are highly creditable to the enterprising farmers of that thrifty town, besides which there are also several farmers' clubs organized in different parts of the town.

Ulysess, Danby, and Caroline have each several farmers' clubs, and other towns will speedily follow in the organization of clubs, from which much good may be expected.

The county society has held two fairs during the past year, the first on the 24th and 25th of June, in which the Tompkins County Horticultural Society united with us, contributing what funds they had on hand, and participating through their officers and committees, in the management of the fair (after which they disbanded as a distinct organization). The weather was exceedingly dry and hot on the days of the fair, and had been so for several days previous, which prevented many from attending the exhibition, and this lessened the receipts thereof.

The large exhibition hall of the society, one hundred feet long by fifty wide, was well filled with fruit, flowers, and fancy articles of household production, and was very tastefully decorated, through the assistance of the young ladies of Ithaca, to whom the society is much indebted for rendering their exhibition attractive.

The receipts and disbursements of this fair were as follows:

RECEIPTS.

Amount contributed by horticultural society,.....	$94 00
For rent of dining saloon,.....	43 00
For tickets of admission,.....	267 46
Donated by E. L. B. Curtis, Esq.,.....	5 00
Amount collected at door of observatory,.....	35 53
Total,.....	$444 99

DISBURSEMENTS.

For expenses,	$138 32
Amount paid fire companies,	50 00
Premiums awarded,	227 00
Balance paid agricultural association,	29 67
Total,	$444 99

The fall fair was held on the 15th, 16th, and 17th of September. The weather for the week previous had been very fine, and the preparations for a grand exhibition had been entered upon, with great spirit, by both managers and exhibitors. The ladies had festooned and decorated our hall tastefully with evergreens, and exhibitors vied with each other in arranging their articles so as to produce the most pleasing effect.

There were entries made by 180 competitors for premiums. The stock department embraced entries of 117 horses and colts, 18 bulls, a majority of which were thorough bred Short Horns, the balance Devons, 83 cows and heifers, composed of Short Horns, Devons and grades, 34 oxen and steers, 48 sheep, and 47 hogs.

After arranging everything in its place, and the hopes of all were buoyant with the prospect of a highly successful and valuable exhibition, a sudden change in the weather, with the threatening aspect of the clouds, warned us of an approaching storm, that burst upon us with a cold, chilling wind, and torrents of rain, which lasted twenty-four hours, thus breaking up what had promised to be the best fair the society had ever held.

The receipts and disbursements were as follows:

Received for rent of dining saloon,		$80 00
do membership tickets ($1.00 each),		313 00
do single tickets ($0.15 each),		340 61
		$733 61
Disbursed for expenses,	$151 97	
Cash premiums awarded,	439 50	
		591 47
Diplomas awarded,	16	
Transactions State Agricultural Society,	29	
do American Institute,	1	
Balance paid to association for use of fair building,		$142 14
do do from June fair,		29 67
do do from State Treasurer,		62 52
Net balance for the year,		$234 33

The above balance of $234.33, has been paid over to the agricultural association for the use of the fair building and grounds, under the arrangements made two years ago, between the agricultural society and the asso-

ciation. The amount of balances previously paid by the society for like purposes, were as follows: in 1856, $572.73; in 1857, $795.89; which, added to the balance for the current year, makes a total of $1,602.95, paid for three years' use of property that cost the association about $8,000, which they offered to sell to the agricultural society for $6,631; and it is expected the society will soon be able to purchase it, by the issue of stock, to be authorized under a contemplated amendment of the Law of 1855, entitled "An act to facilitate the formation of agricultural and horticultural societies."

On the 7th of January, 1859, the society held its annual meeting, at the reading room of the "Ithaca Farmers' Club," at which the following officers were elected for the ensuing year: Ezra Cornell, of Ithaca, President; Walter C. Curran, Ithaca, Edward Persee, Groton, Jas. B. Walker, Lansing, Simeon Snyder, Dryden, Johnson Quick, Caroline, L. B. Hanford, Danby, Richard Sebring, Newfield, Henry Willetts, Enfield, and H. G. Cooper, Ulysses, Vice-Presidents; John Giles, Ithaca, and L. F. Cutler, Newfield, Directors; Obediah B. Curran, Ithaca, Treasurer; Wm. H. Purdy, Ithaca, Secretary; Joseph McGraw, Jr. Dryden, Marshall.

EZRA CORNELL, *President.*

ULSTER.

The fair of this society was held at Kingston, on the 14th and 15th days of October last.

The day preceding the fair (the 13th), was very stormy, which prevented many from contributing to the exhibition, and the first day of the fair being quite unpleasant, the attendance was comparatively small; but on the second day, the grounds were filled with spectators, who were highly pleased with the exhibition and its arrangements. Had the weather been pleasant the two first days, the exhibition would have been equal to any previous fair of the society.

The show of cattle, though not so large as on former occasions, embraced many fine specimens, and competition was close.

The display of horses was very good. Several matched pair, of great excellence, were shown; and many single ones were particularly noticed and admired for their speed and fine action.

The number of sheep was small, compared with former years; but it evinced a marked improvement on the various breeds, produced by careful selections of the most perfect in form, fleece and constitution, for a number of years past.

In numbers, the exhibition of swine was inferior to former years. A few were shown, some of which were very fine.

The show of poultry was rather small, but a few varieties were entered for exhibition, and from those it was evident that the fever for fancy fowls is considerably abated, thus showing that our farmers consider their own

plump species equal in everything (except bones) to the Shanghai or Bramah Pootra, and that by keeping and raising them an immense saving will be made from the gluttonous appetite of either of those feathered elephants, and also absolute relief from the discordant crowing of a biped whose notes can scarcely be distinguished from the filing of a cross-cut saw.

Specimens of butter and honey were exhibited of superior excellence. The butter was of fine color and rich flavor, but the display ought to have been twenty times larger. Our county is admirably adapted to its manufacture, producing as it does the finest grasses, and is equal in all respects to the finest grazing districts of the United States, and also possessing all the requisites of climate, soil, water, accessibility to market, intelligence and capital. Our farmers should make butter and cheese more extensively, and not fail to bring it to these fairs for exhibition and competition.

The display of farm implements was very creditable, showing that our farmers generally have put in use the various labor saving machines of the present day, and which are of such immense advantage and value to them.

The vegetables and the display of manufactured articles, needlework, embroidery, &c., was very good, though not so large as in previous years. No fault, however, could be found with the specimens of needlework, &c., furnished by the ladies of Ulster. It gave assurance that they will continue to contribute to the interest of similar occasions hereafter, by increasing the display of their very tasteful productions.

The address was delivered on the second day of the fair, by Dr. Peter Crispell, Jr., President of the Society. It was of a highly practical and instructive character, and well calculated to stimulate our farmers to increased zeal in their honorable calling.

Our Society has lately been re-organized under the law of 1855, and is in a prosperous condition. The managers contemplate purchasing a lot at this place, and enclosing it properly for the use of the Society hereafter. The following is a list of the officers elected for 1859:

C. L. Kiersted, President; P. Henry Brink, Vice-President; Samuel Frame, Recording Secretary; Benjamin B. Hoornbeck, Corresponding Secretary; John Chipp, Jr., Treasurer; and six Managers.

C. L. KIERSTED, *President.*

BENJAMIN B. HOORNBECK, *Corresponding Secretary.*

WASHINGTON.

Annual meeting held in Salem January 11, 1859. The following officers were elected:

Hosea B. Farr, President, Fort Ann; R. K. Crocker, Recording Secretary, North White Creek; James H. Sill, Recording Secretary, South Hartford; Rev. E. H. Newton, Corresponding Secretary, Cambridge.

REPORTS OF COMMITTEES.

The committee on grain and root crops report, that

There were several specimens of corn presented for premiums. First,

Zerah Rider, Jr., raised on one acre, 99 2-32 bushels shelled corn, for which we award the first premium.

Fayette Hale presented statement of another lot of two acres and eight rods of ground. Crop raised was 320 bushels of ears of corn, which is about 80 bushels per acre of shelled corn, to whom we award the second premium.

Mr. Z. Rider, Jr., presented a statement of a crop of barley raised by him, $2\frac{1}{2}$ acres, 88 bushels, at the rate of 35 bushels and 10 pounds, to whom we award the first premium.

Milo Ingalsbee presented a statement of a crop of oats, which grew on one acre and 24-100, at the rate of $60\frac{1}{2}$ bushels per acre, to which we award the first premium.

H. H. Ingalsbee presented a statement of a crop of rye, which produced at the rate of 19 bushels per acre, to whom we award the first premium.

Fayette Hale presented one bushel timothy seed, to whom we award the first premium.

Mr. Z. Rider, Jr., presented one bushel of timothy seed, to whom we award the second premium.

H. B. FARR,
A. WILLARD.

The committee on root crops respectfully report that only one sample of potatoes was presented for inspection, and that by A. Willard, of Hartford. He shows, as required by the rules, that he has raised 314 bushels of Chili reds on an acre; and though there is no competition, the committee recommends that the first premium be awarded to Mr. Willard.

JOHN McDONALD,
AHIRA ELDREDGE,
JOHN W. EDDY.

Subsequently to the making of the above report, and in the absence of said committee, other specimens were presented, upon which premiums were awarded as follows:

Mr. Hale presented a statement of 15 by 8 rods ground planted to seedling potatoes; dug 120 bushels; to whom we award one volume Transactions as a meritorious premium.

Mr. Hale presented a statement of a crop raised from one bushel Chili potatoes; raised 30 bushels. Vol. Trans.

A meritorious premium was awarded to Daniel Rice, of Easton, for a very fine specimen of Orange carrots. $2.

The select committee to which was referred the five bottles domestic grape wine, presented by H. Volentine & Son, of Jackson, the manufacturers, report that they have tried the article presented, and have heard the statement of Mr. Volentine respecting the purity of the juice and the mode of manufacture. We are strongly impressed with the importance of encouraging the making of pure wine, and recommend that the Society give to Messrs. Volentine a premium of three dollars and two volumes of books,

as an encouragement to continue and improve the manufacture of an article now so seldom found, as pure juice of the grape.

JOHN McDONALD,
MILO INGALSBEE,
S. W. CROSBY,
H. B. FARR,
O. K. RICE.

WASHINGTON.

CAMBRIDGE, *January* 25, 1859.

B. P. JOHNSON, Esq., *Secretary New York State Agricultural Society:*

Sir—In reply to your favor the following is respectfully submitted:

The past has been a favored season in Washington county, for the growth of farm and horticultural products, with the exception of fruit. The destruction of *winter wheat* by insects, in the southern part of the county, has been so uniform and so ruinous as to lead farmers almost entirely to abandon attempts to grow it, although occasionally, upon a favored piece of ground a decent crop has been secured. In the northern section of the county farmers have been more successful, but not without injuries from the same source. It cannot be considered a reliable sure crop.

Spring wheat has done better, and favorable crops have been produced, but in few instances, if any, without similar injury, more or less, against which no sovereign remedy is known to exist. The crop, the last season, was of good growth, and compares well with that of the preceding year, both in quantity and quality. From ten to fifteen bushels to the acre is the usual expectation of the farmer, but occasionally he has a heavier product.

The crop of Indian corn had a luxurient growth and matured well, with a heavy yield, sound and good, equal, if not superior, to that of many years past. The season was not only favorable but insects were less injurious. Seed generally proved good and very little replanting was required compared with former years. The average yield was about forty bushels per acre. The premium acre 99⅞ bushels by weight.

Rye had a good common growth but not distinguished either in quantity or quality above that of former years. Some farmers have conscientious scruples in regard to the growing of the crop, as the product in other hands produces a material injurious to society and destructive to the consumer. For similar reasons *barley* has but few ardent cultivators. The few who raised it had a good crop. Premium crop thirty-five bushels to the acre. Rye is used profitably for feed in the proportion of about one-third with corn and oats, and especially for the fattening of beeves. Premium crop nineteen bushels per acre.

The growth of *oats* has been fine—superior to the preceding season, of a heavy quality, and secured well. An average crop is about forty-five bushels to the acre. The premium crop was 60½ bushels.

Buckwheat had a good common productive growth but not extra, and is principally raised for domestic consumption.

Flax was excellent in growth, seldom better, well seeded, and well clothed with lint, but not as extensively grown as in former years.

The season proved favorable for *potatoes* which are extensively cultivated in the county. The product was good both in yield and quality, and suffered comparatively little from the ravages of blight and disease. Premium crop 314 bushels of Chilis per acre.

Peas are rarely seen as a farm crop, on account of their injury by the bug. Some are occasionally sown with oats for feed, and yield a fair profit.

Beans have had a propitious season, a full plump growth, a good yield, and are a remunerative crop, yet, not a favorite one with farmers and therefore but few are raised.

The crop of *hay* was heavy, superior in quality as well as quantity, secured in the finest order, with its luscious green and sweetness.

Fruit was less than a common yield, and not very good at that, trees and vines having suffered by the ravages of insects and the severity of preceding winters. The pernicious effects of insects in the body and at the roots of trees, in the foliage and in the fruit, are powerful foes to combat, and must be promptly met to secure the luxury of good fruit. By insects, small and feeble in appearance, wheat crops suffer materially, and it is yet to be discovered what variety or varieties wholly escape their ravages in this county. The drainage of lands is becoming a subject of much interest to farmers, both to improve the quality and product of the soil, the beauty of their farms and better preparation of fields, either for a wet or dry season. It is evident that the agricultural interests in the county, as a whole, are annually advancing in the price of lands and the productions of farms. This is owing to the industry and moral tendencies of the profession, the increase of intelligence, the stimulants of the annual fair, and the facilities to a market by water and railroad.

EPHRAIM H. NEWTON, *Cor. Sec'y.*

WARREN.

The second annual fair and cattle show of the Warren County Agricultural Society, took place at Luzerne, on the 15th and 16th of September. Situated at the junction of the Sacandaga and Hudson rivers, Luzerne affords a commanding central spot for the farmer west of the mountain, and in northern Saratoga, to collect and compare their products and results. For the two previous days a sprinkling of horses and cattle were observed from the more distant places. But on the morning of the 15th, long strings of wagons loaded with products, interspersed with animals, were observed on the various highways converging to the place. From Sacandaga, were young bulls, fast horses and farm products. Luzerne turned out beets which weighed seven pounds each; snow-ball turnips, weighing eight

pounds each; white and red onions, weighing two pounds each; Devon and native stock; also Leicester sheep. Bolton sent a north Devon, and a half Ayreshire bull. Chester exhibited some good horses. Johnsburgh, Lima beans, showing that the difficulty in raising crops, is not so much in the soil as in the people. Queensbury sent out a cucumber four feet long, and weighing seven pounds, and a squash weighing 105 pounds. Glen's Falls was represented by five varieties of grapes, from the garden of L. L. Arms, and various manufactures. Of horses, there were sixteen entries, and cattle, forty-five. There were twenty-four kinds of potatoes, embracing all the choice varieties, and twenty-six entries of corn, including six kinds—the prevailing kind was the Dutton, or Canada corn. The grounds selected, were an elevated plateau, from which a panorama of lake, river, meadow and hill, formed a view such as the lovers of nature love to dwell upon. They were laid out under the immediate supervision of Mr. Skillman, the energetic secretary, and W. W. Rockwell, to whom the successful carrying out of this part of the programme, was entirely owing. A tight fence enclosed about seven acres. Next to this was a track for the display of horses, carefully laid out and graded. Within the remaining space, was a covered building for the exhibition of manufactures and produce; stand and posts for cattle and horses; enclosures for sheep and swine; a platform for the judges, and certain private stands for the convenience of families.

The first day was beautiful, without the sun. The morning was occupied in receiving the various articles and arranging them in their places.

There were specimens of winter and spring wheat, and winter rye, with the flour manufactured from them. A rustic sofa and rocking chair, made from the roots of pine stumps, the work of Harmon St. John, of Luzerne, were novelties in their line.

Wheat straw, four feet four inches long; rye straw, five feet seven inches long; a pumpkin vine, with eight pumpkins, grown from a single seed; another with six pumpkins, which took a premium; the scull of a sheep, with four horns, and corn stalks fifteen feet seven inches high, were among the curiosities.

There was a bull and a calf of native stock; the bull was four months old, and weighed 520 pounds—the heifer three months and fourteen days old, and weighed 460 pounds.

The evening was occupied by an address from Judiah Ellsworth, Esq., of Saratoga Springs, a copy of which was requested for publication.

THE LESSONS IT TEACHES.

The results of this fair are suggestive. It was probably an average exposition of the capabilities of Warren county, and northern Saratoga. Whatever short-comings it may otherwise have, the county is certainly not wanting in the elements of good soil and climate. It is climate which makes the difference in production; for a good soil is precisely identical in its construction, whether located in Illinois or Wisconsin, or in Warren county. No one who saw the varieties of potatoes and corn, the collection of enor-

mous root crops, the specimens of wheat, rye and oats, with their long straw, the long corn stalks, &c., from various sections, can deny that nature has been bountiful to us. A soil which is worn out, or wanting in certain principles, will be sterile. Wherever it is known that this is all that is required, the intelligent farmer will endeavor to supply such deficiencies.

Among the omissions, may be noticed the *orchard*, which is a most prolific source of profit to the farmer. Not an article from this quarter was offered. Yet it is well recognized, that where potatoes, corn and lima beans grow in perfection, the apple, pear and plum, will also yield a bountiful return for the investment.

There were no agricultural implements, except an apple parer and a corn sheller. There were no horse-rakes; no patent mowers or reapers; no modern plows; nothing, in fact, to show the vast strides which have been made in this branch of agriculture. One great reason is, probably, that very few farmers are in a condition to allow of their use. The pine stumps still cover a great portion of tillable lands.

There were but two entries of sheep. Two of butter; none of cheese. And in these respects, the show was incomplete; because the county has as fine dairies as can be found in the State.

We would like to have seen the specimens of rakes, hoe handles, pitchforks, and other articles, from Stoney Creek.

The most obvious deficiencies, can be attributed to indifference, or carelessness, and another year will doubtless supply the want.

The wants of the *farm*, which the society has hardly touched yet, are perceptible, from the omissions mentioned above, of implements and fruit. These require skill, capital and time. But when nurseries are so plenty, and stump machines so accessible, there is every reason to hope that farms, which are otherwise available, will be cleared from the unsightly excrescences, and fruit become as plenty as garden sauce. As a whole, the fair was a successful one, and gives promise of great good for the future.

Material progress was exhibited over last year, as will be observed by the following comparison of entries:

	1857.	1858.
Horses,	25	60
Cattle,	25	45
Other stock,	9	37
Produce,	24	141
Manufactures,	..	26
Total,	83	309

The receipts, from all sources, were,	$378 12
Disbursements,	374 05
Balance on hand,	$4 07

Officers for 1859.—B. C. Butler, Luzerne, President; Lewis L. Arms, Glen's Falls, Robert Gilchrist, The Glen, John L. Weatherhead, Chester, Sanford W. Johnson, Thurman, Westel W. Hicks, Caldwell, and Wm. B. Farlin, Warrensburgh, Vice-Presidents; C. H. Skillman, Corresponding Secretary; Caleb S. Graham, Recording Secretary; W. H. Wells, Treasurer.

WAYNE.

B. P. JOHNSON:

Dear Sir—Neither the operations of the Wayne County Agricultural Society, nor anything important in the agriculture of the county during the year 1858, requires a very extended report.

The financial pressure which commenced late in the previous year, has been seriously felt during the present one. Not only the tradesman and the mechanic, but the farmer also, has keenly felt its effects. Agricultural improvements of all kinds have been partially or wholly suspended for want of means to carry them forward. The light crops of 1857, and the low prices realized for them, together with stagnation in all kinds of business, brought the farmer into straightened circumstances, disappointing him for the present, discouraging him for the future.

But the application of economy, the great restorer of financial revolutions, together with the bountiful harvest of the present year, and the remunerative prices realized for all kinds of agricultural productions, have revived the drooping spirits of our producing classes, and hope again cheers the toil and animates the labors of the husbandman. Agricultural improvements, such as draining, fencing, &c., are beginning to be resumed, the general effects of which will soon add largely to the receipts of the farmer.

The Wayne County Agricultural Society held its usual exhibition of horses on the 5th and 6th of August last, and was a decided success. About 10,000 visitors were present, and the stock exhibited was probably superior to any exhibition of horses ever held in the State. These exhibitions afford an excellent opportunity for raisers and dealers to sell and buy good horses, and for this object chiefly were these fairs instituted and sustained.

The annual fair and cattle show of the society commenced on the 22d of September last. After one day's exhibition, which was creditable to the society, the weather became so inclement as entirely to preclude the possibility of a successful show, and to induce an adjournment to October 15th and 16th, at which time the fair was resumed and concluded, being really excellent in all its appointments. The show of cattle, and particularly Durhams, was better than ever before held in the county; several valuable acquisitions of that kind of stock having been made by some of our enterprising farmers during the year.

The annual meeting of the society was held at Lyons on the 5th

January, 1859, and adjourned to 19th January, at which time the following officers were chosen for the year 1859:

President, D. W. C. Van Slyck, Lyons; Vice-President, Daniel Jenison, Galen; Secretary, Henry P. Knowles, Lyons; Treasurer, J. V. D. Westfall, Lyons; Directors, Hiram G. Hotchkiss, Lyons; B. R. Dummis, Sodus Point.

DE WITT C. VAN SLYCK, *President.*

WESTCHESTER.

Dear Sir—In consequence of absence from my usual place of business, I did not receive your circular relative to the annual report in due course of mail. I regret that the executive committee of the State Society should have suffered any embarrassment from any omission on the part of this society. I thought the report was transmitted immediately after our annual meeting, as the matter was brought to the attention of the president. I had not a doubt but that he had attended to the matter. I wrote to him to-day upon the subject.

At our annual meeting we adopted a new constitution and by-laws preparatory to incorporating, and will file our certificate immediately after the April meeting. Herewith you will find a list of officers elect under intended new organization. *This* should have been forwarded earlier, but I have waited for the assent of one or two of the officers elect to serve, which I have not yet received, and of whose acceptance I have strong doubts. Should any decline to accept office before the April meeting of the society, we will then fill the vacancy or vacancies, of which I will at once inform you.

I am, dear sir, very respectfully yours,

JOHN COWAN, *Secretary.*

Col. B. P. Johnson, *Secretary State Agricultural Society, Albany.*

List of Officers.—President, R. Mott Underhill, Yorktown; 1st Vice-President, John Jay Wood, Bedford; 2d, A. P. Cummings, Mamaroneck; Treasurer, James Armstrong, White Plains; Corresponding Secretary, Col. D. R. Sherwood, Sing Sing; Recording Secretary, John Cowan, White Plains.

JOHN COWAN, *Recording Secretary.*

WYOMING.

The annual fair was held in the village of Warsaw, on the Society's grounds, Sept 28th to 30th. The annual address was delivered by Hon. A. B. Dickinson, of Steuben county.

The receipts of the Society for the year,	$962 20
Expenditures, premiums and grounds,	962 20

Officers for 1859.—J. A. McElwain, President, Warsaw; Edwin L. Babbitt, Secretary, Warsaw; James C. Ferris, Treasurer, Warsaw.

The committee on Durham bulls reported:

Though our farmers are honestly divided in opinion as to the relative merits of the Devon and Durham breeds of cattle, these two classes being more esteemed in the county than any other, we cannot but think that much may and will be accomplished by combining particular properties in these animals by judicious crossing. Though some are violently opposed to this course, they do not seem to be aware of the fact that most of the so-called pure bloods have been derived from various crossings.

But should the views of all not perfectly harmonize in these particulars, we trust there is too much good sense in the yeomanry to follow the lead of some of our political demagogues, and bolt from the track, because their preferences are not acknowledged by the majority to be based upon the principles of justice and unerring wisdom.

YATES.

The eighteenth annual fair of the Yates County Agricultural Society was held on the Society's grounds, in the village of Penn Yan, on the 23d and 24th of September, 1858.

The attendance was large, and the show of stock, sheep, swine, agricultural and mechanical implements, vegetables and grain, was as good, if not better, than at any previous fair. Mr. D. C. Thomas, of Potter, not only took the first premium at our fair on his cattle, but also did at the Rushville and Canandaigua fairs; and Mr. J. Rapler, of Barrington, took the first premium at our fair, the silver cup at Canandaigua, and the first premium at the Dundee, Watkins and Havanna fairs, on a Merino buck.

The show of fruit at our fair was not as good as usual, the season seeming to have been unpropitious to its full development. We think, however, that more attention is now paid to its culture in our county, than at any time heretofore. We have three excellent nurseries, and almost every farmer is adding to his old, or setting out a new orchard.

The ladies' department was as attractive as usual, not only in the ornamental and showy, but also in the plain and useful part of home-made cloths, carpets, stockings, mittens, preserves and bread.

The annnal address was delivered by our townsman, John Mallory, Esq. It was eminently practical, and was listened to with marked attention.

The annual meeting was held on the 11th of December last, when the treasurer's report was read and adopted, as follows:

Balance on hand from last year,	$49 51
Received from sale of tickets,	262 20
Received from members,	270 00
Received for rent of grounds,	20 00
Amount carried forward,	$601 71

Amount brought forward,		$601 51
Expenses,	$227 33	
Interest,	35 00	
Premiums paid,	295 06	
		$557 39
Balance on hand,		$44 32

Officers for 1859.—President, Job L. Babcock, Barrington; Vice-President, Guy Shaw, P. O. address, Penn Yan; Secretary, A. F. Stark, Penn Yan; Treasurer, B. L. Hoyt, Penn Yan; and a board of nine directors.

WM. T. REMER, *President.*

B. L. HOYT, *Secretary.*

TOWN AND UNION ASSOCIATIONS.

These associations are evidently accomplishing much good. From several of the societies very interesting reports have been received, and the continued prosperity of the associations gives evidence of their adaptation to the wants of the farming interests.

The societies of Dryden, Tompkins county, Hartland, Niagara county, Lewisboro, Westchester, Lodi, Seneca, Rushville, Yates and Ontario, Skaneateles, Onondaga, Tonawanda Valley, Wyoming, all furnish reports of interest.

The Hartland Society gives a very full account of the manufacture of syrup of the sugar cane. The Lewisboro Society has had a course of lectures, and charts have been prepared and published by the Rev. D. Shart, of the inorganic elements of grain, potatoes, turnips and hay, and an analysis of soils, fertile without manure, fertile with manure, and barren soils. Skaneateles Farmers' Club has held 10 meetings during the year, and the report is full of interest. Tonawanda Valley Society gives the origin of the Society, and the advantages which have resulted from its organization.

J.

Dryden Agricultural Society.—The third annual fair and exhibition of the Dryden Agricultural Society was held at Dryden village, on Thursday, September 30th. The weather was very unfavorable (the great blow of September 30th occurred in the afternoon of the first day), and prevented our having any exhibition on Friday.

The number of people in attendance was very large. The competition for premiums spirited, and the animals and articles showed a decided improvement in quality, and in some respects, in numbers. The exhibition and decoration of the hall surpassed anything ever beheld in the county.

The display of horses, as stated by good judges, surpassed anything of the kind in the county, and is not exceeded by the generality of the State fairs. About one hundred and seventy-five were on exhibition.

The display of cattle was very good, numbering about two hundred, including many thorough-bred Short Horns and Devons. Much interest is taken in this section in the improvement of cattle.

The exhibition in the other departments was equally good.

On the 22d of last May we had an exhibition of horses, cattle, sheep, swine, &c., and agricultural implements, much to the credit of our society, and as we trust, beneficial to the agriculturist.

The pecuniary success is likewise gratifying. In 1857 the society purchased seven and three-fourths acres of ground at $125 per acre, erected a dodecagon building, eighty feet in diameter, (and a very commodious one too,) fenced and ditched the ground, erected hitching places, constructed a nice track for driving, &c., at a total expense of $3,248.08. The past year this ground has been ornamented with beautiful shade trees.

In order to extinguish this debt the society issued scrip of ten dollars per share, and with little difficulty nearly the whole was readily subscribed.

The receipts during the year, as per treasurer's report, were, ...	$911 41
Expenditures for premiums, &c., ...	870 99
Leaving in the hands of the treasurer, ...	$40 42

The annual meeting of Dryden Agricultural Society was held at Dryden, for the election of officers, and the transaction of business relating to the general interest of the society. The meeting was well attended, and every thing passed off harmoniously.

GRAINS.

The past year has been unfavorable for the farmer in this section, owing to the wet, late spring—the dry weather during the first days of June, and the very warm and damp or wet weather which followed.

Winter wheat.—Mediterranean yielded seventeen and one-half bushels per acre, others very much affected by the midge.

Spring wheat.—Mammoth and early sowed Scotch Fife succeeded best. Italian and other varieties failed, owing to "the sowing in the mud," and the midge.

Corn is very good (perhaps never better); yield, thirty-five to forty bushels per acre.

Rye.—But little raised, although a good crop the past year; yield, twenty bushels per acre.

Barley.—Not an average crop, owing to the wet spring and the dry weather following, although there were some very good pieces,

Oats.—Early sowed did well; late sowed, almost a total failure, owing to the same causes as barley, and the rust.

Buckwheat.—Poor, with a few exceptions; early sowed burned by the sun; late sowed, much frozen by the frost in August.

Beans.—A fair crop, averaging eighteen bushels per acre. Marrow bean so far as planted yielded well.

Hay.—Better than an average. Meadows of the first and second years' seeding did best.

Fruit.—Not a good crop; decaying early from injuries received from the "great blow."

Drained lands have been less injuriously affected, both by the wet and drouth, than undrained.

Farming is receiving a new impulse in this section.

The officers for 1859 are: John P. Hart, President; Peter V. Snyder,

Vice-President; Alviras Snyder, Secretary; Thomas J. McElheny, Treasurer; L. Griswold, E. Perlee, J. Mineah, Jr., D. Bartholomew, J. H. George and C. Bartholomew, Directors.

The above is respectfully submitted as the report of Dryden Agricultural Society, this 25th day of January, 1859.

ALVIRAS SNYDER, *Secretary.*

HARTLAND.—Another working year of the Hartland Agricultural Society has closed, leaving the society in a prosperous condition and full of ardor to promote the agricultural interests of the town the present year. I hand you a statement of the condition of the society, and a list of officers for 1859.

The annual show held at Johnson's Creek, Sept. 24 and 25, was a decided improvement on our former exhibitions in almost every department except fruit and grain. A severe hail storm about harvest time damaged what fruit there was, (the crop being light,) and beat out large quantities of grain of all kinds, so that fields that promised large yields, only gave from five to ten bushels per acre.

The horses and cattle showed marked improvements, and these improvements are mainly owing to the interest awakened by the existence of an agricutural society, which brings farmers together to see what each other possess. This begets a spirit of rivalry in a good cause. The result is that the beautiful Durhams and Devons take the place of the blacks, browns and brindles, that do not possess grace or beauty enough to excite the pride of oven a third rate farmer.

The society design to obtain accurate statistics in relation to the different kinds of crops upon which premiums will be offered. Below is a statement by Mead Atwater of his method of making Sorghum syrup, for which was awarded the first premium:

I planted nearly a quart of seed about the first of the fifth month, (May,) on gravel and sand soil, where potatoes were grown the year previous. About the middle of the month the blade began to appear; when large enough it was hoed, and about the 10th of the seventh month, (July,) it was gone through again with the hoe to clear out the weeds. This was all the labor bestowed. About the first of the ninth month (September,) the tassels came out, and by the 15th the seeds began to turn brown, and by the 27th one-half was judged ripe enough to grow. I now began the operation of harvesting, first by stripping off the leaves, (which can be best done while standing,) next cut up the stalks at the gronnd, cut off the tassels as seeds, and removed the stalks to the crushing mill. This machine was of the rudest kind, with two wooden rollers 16 inches in diameter, standing upright, and turned by a horse. I passed the stalks three times between the rollers, which expressed nearly all the juice. I then placed about half a barrel of the liquor in a large sheet-iron pan, set over a furnace prepared for the occasion; put in nearly half a pint of lime-water, had under it a brisk fire of solid wood; then watched its boil-

ing, not allowing it to be stirred until the thick green scum began to break from boiling; then skimmed, and was very careful not to let any of the scum boil in, and kept skimming all that arose until it was boiled low enough to take off. It was then turned into clean vessels, and let stand and settle. I then boiled and put to settling three batches at a time; after settling, drained them off, and again put the whole into the pan for finishing, putting in some milk and eggs to cleanse it, and again carefully skimmed and boiled down over a hot fire, until I judged it low enough to put away for use.

By the above simple process, I made twenty gallons of beautiful syrup w hat was grown on one-eighth of an acre of land. To ensure success, seed should be procured that has not grown near Indian corn or broom corn, as it will mix and spoil the syrup. Plant early, so that the seed may mature, as good syrup cannot be made from green Sorghum.

MEAD ATWATER.

HARTLAND, 11*th Month*, (*Nov.*,) 1858.

The annual meeting was held Jan. 26, 1859. Hon. T. T. Flagler delivered the annual address, subject, "The Discouragements and Encouragements of the Farmer," which was just such an address as would do every farmer in the State good to listen to. The following officers were elected for 1859:

President, Abner Kittredge; Vice-President, Henry Hoag; Secretary, J. C. Duel; Treasurer, Peter Culver; Directors, Simms Spalding, Jr., and George L. Angevin.

The secretary has received during the year and from last year,..	$104 46
Expended during the year,....	103 83
Now in the treasury,.....	63

Also received from the State twenty copies of the Transactions of State Society and American Institute, which have been expended in premiums.

ABNER KITTREDGE, *President*,
J. A. DEUEL, *Secretary*,
PETER CULVER, *Treasurer*.

ITHACA FARMERS' CLUB, organized at Ithaca, Tompkins county, Jan. 1, 1859, under the act of 1855.

Certificate of organization of the Ithaca Farmers' Club at Ithaca, Jan. 1, 1859.—The undersigned persons being of full age, and citizens of the United States, and of the State of New York, do hereby certify that we organize ourselves, our associates and successors, into a body corporate, under the name and title of the Ithaca Farmers' Club.

The business and object of said club shall be to improve the agriculture, horticulture, and the mechanic arts, and to advance the standard of knowledge among the productive members of society by establishing a library and reading room, the collection of an agricultural museum, and the

establishment of a system of interchange of seeds and specimens of agricultural and mechanical productions.

The officers of said club shall consist of a president, one vice-president, a treasurer, a recording and a corresponding secretary, and seven directors, inclusive of the president, whose names, for the first year, are as follows:

For President, John Giles; Vice-President, Walter C. Curran; Treasurer, D. C. Hazen; Recording Secretary, N. Crittenden; Corresponding Secretary, Ezra Cornell; Directors, S. Robertson, Thomas P. St. John, Joseph Kellogg, Newell Hungerford, Ezra Cornell, Anson Braman.

The foregoing certificate was signed as below indicated.

STATE OF NEW YORK, } ss:
Tompkins county, }

On this first day of January, 1859, personally came before me, Ezra Cornell, Joseph Kellogg, Elbert Curtis, Anson Braman, James C. Cook, G. C. McClune, Samuel Love, Charles E. Swift, F. A. B. Ridgway, Wm. L. Mitchell, James H. Wilson, Warren Valentine, Frederic Burs, S. Miller, Charles G. Day, R. D. W. Manderville, O. B. Curran, E. C. Seymour, John Giles, W. C. Curran, J. S. Beebe, N. Crittenden, Jr., J. S. Tichenon, D. C. Hazen, T. P. St. John, Smith Robertson, A. B. Cornell, Isaac Love, David Emery, George A. Hayborn, Wm. H. Cornell, W. P. Williams, F. C. Cornell, V. J. Terry, and L. B. Johnson, to me personally known to be the same persons named in, and who executed, the foregoing instrument, and severally acknowledged the same.

A. M. LUCUS, J. P.

After the organization the club took up the subject of the library, which already numbers 150 volumes, and discussed various plans of management in reference thereto, after which it was voted that the library would be more useful to the members of the club and to their brethren in the town and county, if kept at the club-room, as a library of reading and reference, than it would be if permitted to circulate.

It was voted that the details necessary to carry the designs of the club into operation be referred to the directors.

Voted that the rooms of the club be tendered to the Tompkins County Agricultural Society for their annual meeting on Wednesday the 5th inst., and for their future meetings.

The club acknowledges the receipt of the following books donated to the Ithaca Farmers' Club:

From Mrs. Samuel Love, the Holy Bible; S. Love, Essay on Sheep, by R. L. Livingston; O. E. Wood, American Herd Book, three vols.; Wm. R. Humphrey, Andrew's Report on Colonial and Lake Trade, three vols.; Railroad Commissioners' Report for 1854, 1855 and 1856, two vols. Documentary History of New York; Boardman & Finch, nine vols. Colonial History of New York, three vols. Patent Office Report, two vols. Finance Report; Joseph Esty, one vol. Patent Office Report, five vols. Niles, Register, five vols. Missionary Magazine; D. Emery, five vols. Messages and Documents, Smithsonian Report, &c., two vols. Fitch on Insects; C.

G. Day, two vols. Messages and Documents, Barnard's School Architecture, three vols. Commerce and Navigation, three vols. Land Sales for Taxes, New York Provisional Congress ; Digest of Patents, 1790 to 1839 ; Dr. Patterson for himself and Ferris and Cushian, one vol. Commerce and Navigation, two vols. Memoir Board of Agriculture of State of New York, three vols. Transactions American Institute, four vols. Trans. New York State Agricultural Society; E. Cornell, sixty vols. selected agricultural works, two vols. History Westchester County, six vols. Transactions New York State Agricultural Society, five vols. Architect, two vols. Nicholson's Operative Mechanics, two vols. Chemistry of the Arts, eight vols. Mechanics' Magazine, two vols. History Cotton Spinning, twenty vols. miscellaneous; also, subscribed for Country Gentleman, Agriculturist, Rural New Yorker, Cultivator, New England Farmer, Stock Breeders' Journal, Ohio Farmer, and Michigan Farmer.

Several other gentlemen promise to donate books not yet sent in.

Regular meetings of the club will be held at their room, over post office, every Thursday evening.

JOHN GILES, *President.*

E. Cornell, *Cor. Sec'y.*

Lewisboro Farmers' Club.—Dear Sir: I send you a report of the proceedings of the Farmers' Club of Lewisboro, for the year 1858. During the year we have had addresses from several able and distinguished speakers, among which may be named Rev. D. H. Short, of Ridgefield, Hon. Horace Greeley, of New York, and Solomon Mead, of New Haven. The *lectures* were well attended. On some occasions, several hundred were present, and all appeared well pleased, and convinced of the importance of the subjects treated of in the lectures, viz., Agricultural Chemistry, by Rev. D. H. Short ; Muck, as a Fertilizer, by Solomon Mead ; Drainage, by Hon. H. Greeley. Accompanying this I send you a copy of a chart, prepared by the Rev. D. H. Short, and by him presented to the club, which we have had printed, and a copy distributed to each member. Several copies of Transactions of State Agricultural Society, and of American Institute, have been distributed to each member of the club. Also some Patent Office Reports ; all of which are highly prized, and have been the means of increasing an interest in the *club.* Several packages of seeds have been received from the patent office, and distributed among the members, and several interesting reports have been received from those that have experimented with the seeds. A large share of the seeds have been approved of. A few have been condemned, or reported of no value, and some have failed to vegetate. There have been a larger number of members belonging to the club the year past, than at any former period, and the prospect for the year to come, is equally good.

Officers for 1859.—Linus Mead, President ; Eli Keeler, Vice-President ; Henry Keeler, Secretary and Treasurer.

HENRY KEELER.

South Salem, Westchester Co., *Jan.* 29, 1859.

Charts prepared by Rev. D. Short, and presented by him to the Club, and distributed to each member of the Club.

Inorganic elements.	Corn.	Wheat.	Straw.	Rye.	Oats.	Potatoes	Turnips.	Hay.
Phosphoric Acid,...	49.2	47.0	3.1	47.3	40.8	11.3	7.6	6.0
	17.7	.....	.....	3.8	2.7	.....	9.3	.....
Sulphuric Acid, ...	0.5	1.0	1.0	1.5	10.5	7.1	13.6	2.7
	0.5	.....	.....	0.8	3.3	.....	12.5	.....
Chlorine, ...	0.3	.....	0.6	.....	0.3	2.7	3.5	2.6
	2.0	.....	.....	.5	3.2	.....	10.0	.....
Lime, ...	0.1	2.9	8.5	2.9	4.9	1.8	13.6	22.9
	8.6	.....	.....	9.1	8.1	.....	23.3	.....
Magnesia, ...	17.5	15.9	5.0	10.1	9.9	5.4	5.3	5.7
	6.6	.....	.....	2.4	3.8	.....	3.1	.....
Potash, ...	23.2	29.5	7.2	32.8	.....	51.5	42.0	18.2
	9.6	.....	.....	17.4	19.1	.....	28.6	.....
Soda, ...	3.8	.....	0.3	4.4	.....	.....	5.2	2.3
	27.7	.....	.....	0.3	9.7	.....	5.4	.....
Silica, ...	0.8	1.3	67.6	0.2	2.7	8.6	7.9	37.9
	27.0	.....	.....	64.5	48.4	.....	.8	.....
Iron, ...	0.1	.....	1.0	0.8	0.4	0.5	1.3	1.7
	.8	.....	.....	1.4	1.8	.....	.8	.....

The upper figures designate the quantity of each inorganic element as it exists in the grain, the lower figures the quantity in the straw.

Analysis of Soils.

	Fertile without manure.	Fertile with manure.	Barren.
Organic matter, ...	9.7	5.0	4.0
Silica, ...	64.8	83.3	77.8
Alumina, ...	5.7	5.1	9.1
Lime, ...	5.9	1.8	.4
Magnesia, ...	.85	.8	.1
Oxide of iron, ...	6.1	3.0	8.1
Oxide of manganese, ...	.1	.3	0.5
Potash, ...	.2	trace.	trace.
Soda, ...	.4		
Chlorine, ...	.2		
Sulphuric acid, ...	.2	.075	
Phosphoric acid, ...	.45	.175	
Carbonic acid, ...	4.0	.44	
Loss, ...	1.4	....	.45
Parts by weight, ...	100	100	100

Lodi, Seneca County.—The second annual fair of the Agricultural Society of the town of Lodi, was held at the village of Lodi, on the 23d and 24th of September, 1858. Since our last annual report, this society have leased from three to four acres of ground, for a term of years, upon which has been erected a commodious building, thirty-six feet wide by eighty feet in length, for the exhibition of articles of domestic manufacture, fruits, flowers, vegetables, &c.; also a suitable and convenient office for the treasurer, clerks, &c. A permanent and substantial board fence, seven feet in height, encloses the grounds. A smooth and well graded driving track has been fitted up for the exhibition of horses and horseman-

ship, in harness and saddle. The very unpleasant state of the weather during a portion of the time, especially on the last day of the exhibition, materially affected the society in a financial point of view; but, notwithstanding this decrease in the receipts, the board of managers, by practicing rigid economy in the various expenditures, have succeeded in keeping the society free from debt, or other incumbrances.

The increasing interest manifested by the citizens generally, in the improvement of farm stock, of all classes, together with articles of mechanical and household productions, was clearly apparent from the great number of entries made—the whole number of which was 659.

The entries of horses were 157, comprising many fine pairs of matched carriage and draft horses, with a splendid show of single horses, and an unequalled display of mares and sucking colts.

The exhibition of cattle was good; among which were some fine specimens of Durhams, Devons, and other varieties, and a number of pairs of fine working oxen.

The show of sheep, swine and poultry was good, but not as full as desirable.

A grand display of pleasure carriages, buggies and farm wagons, were on exhibition, which were very creditable to the manufacturers.

Too much praise cannot be given to the ladies for their very valuable service rendered this society in trimming and decorating floral hall; also for their many contributions of articles for exhibition, of beauty and durability, which added largely to the interest of the exhibition, and attracted the admiration of all present, as they were justly entitled to do.

The annual address was delivered by Hon. E. B. Pottle, of Ontario county, which was plain and practical, and gave general satisfaction to the large audience present.

Cash on hand, Jan. 19, 1858,	$129 56	
Received for tickets, donations, &c., Sept. 23 and 24, 1858,	334 58	
		$464 14
Paid premiums, for 1857,	$4 75	
for printing, premiums, &c., 1858,	173 19	
for permanent fixtures,	203 25	
		381 19
Balance on hand, Jan. 18, 1859,		$82 95

Not included in the above items, $100, in labor voluntarily contributed in permanent fixtures.

Officers for 1859.—Lewis Post, President; Stephen B. Smith, Vice-President; S. B. Mundy, Secretary; M. B. Ellison, Treasurer.

S. B. MUNDY, *Secretary.*

SKANEATELES FARMERS' CLUB.—To-day, Jan. 7th, the Farmers' Club held their annual meeting. The reception of the reports of the retiring officers was one of interest, and on motion of W. P. Giles, a copy was ordered to be sent the Hon. J. Holt and the editors of the Country Gentleman.

The treasurer's report being merged in the secretary's, the latter is only copied:

Gentlemen—Once more I have the pleasure of addressing you, and presenting to the Skaneateles Farmers' Club my annual report.

The affairs and standing of the Club are promising, and I think on a good basis, and it remains for you to insure its continued prosperity.

During the past year thirty meetings have been held—this is at least seven more than the previous year—whilst the subjects discussed have been fewer, as more extension has been taken in discussing them, than usual. The business of the fair engrossed seven or eight—one more than last year.

The subjects discussed are as follows: 'Wintering Stock,' 'Relative value of the different kinds of Fodder for Stock;' 'The Preparation and Application of Manures;' 'The comparative value of the different Breeds of Cattle, Domestic and Imported;' 'Fruit and Fruit Culture;' 'Culture of Fruit and Garden Vegetables;' 'What Changes in our Cropping and General Farming can be adopted to make the business more lucrative?' 'Fencing Farms;' 'Fencing and Destruction of Insects Injurious to Farmers;' 'Best Mode of Wintering Stock;' and miscellaneous subjects. I have observed that those subjects that were continued from meeting to meeting, increased the attendance and interest more than usual.

The library, I am happy to inform you, has, during the year, received many valuable additions. Twelve volumes were added by purchase. To the Hon. A. P. Granger we are indebted for the most expensive books, and such books as money could not purchase. Messrs. S. P. Rhoades, W. J. Townsend, A. Hitchcock, Jr., of California; Hon. B. P. Poore, Washington; and Samuel Edwards, Illinois, also have contributed to our infant library. It now contains about 120 volumes, valued at about $200.

To the kind attention of the Hon. J. Holt, we are under many obligations, in his distribution of seeds, of which we received many packages, and the recipients, in many cases, have reported either verbally or in writing, the result. These latter I sent to Washington.

The State printer has been more prompt in sending the copies of Transactions, awarded us by the Legislature, than heretofore. It is to be regretted that we cannot get a larger appropriation. May it not be done by instructing our Members of Assembly in this particular?

The number of members the past year has been less than heretofore, whilst our expenses have been greater. Ought this to be? Must it go forth to the world that the renowned Skaneateles Farmers' Club numbers only forty contributing members, and five honorary members? It ought to be four hundred and thirty, and would be so, did that interest exist that is desirable. What agriculturist or mechanic is there in this and adjoining

towns, that can add the mite required to extend the usefulness of this institution?

There are many things that requires attention, and by a little forethought might be provided for. The securing a good room permanently for the use of the Club, is one. Also that more extensive arrangements may be made for the library and museum.

The museum commenced in January last, I think, for the reception of fossils. Seed and farm productions had been previously contributed. Edward Shepard made a first donation, and was followed by Messrs. T. Edwards and W. J. Townsend, who both contributed largely. Some valuable varieties are to be found among them, as Prof. Taylor informed me when here. He, too, contributed to our stock from his well furnished collection. Cases should be provided to secure the specimens from dust and being handled.

Had we a room, such as we ought to have, a large variety of specimens in natural history could and would be soon added. Such additions would soon make the Farmers' Club room attractive to old and young; to those around us, and those abroad.

There are two wants I will mention; first, more contributing members. and second, a full attendance on Saturdays, to hear the proceedings.

I think, too, that some plan may be adopted to have meetings in the school districts during the winter months. There is no district in this town but could muster a meeting and speakers—plain, practical farmers. If the assistance of the Club should be necessary, it may be given. Would not some such plan increase the interest that seems to display itself at our annual fairs?

I cannot eulogise, so shall only state that the fair was all that the Club anticipated, and greater than many expected, all things considered. I will merely state that the number of diplomas awarded, for cattle of all kinds, was 49; horses, 38; sheep, 14; swine, 5; poultry, 11; grain, corn and flour, 26; flowers, 3; vegetables, 50; farm implements, 12; fruits, 28; butter and cheese, 8; bread, 8; domestic manufactures, 21; needlework, 17; fine arts, 20; stoves and hardware, 1; carriages, 2; miscellaneous, 32; total, 345.

The expenses of the fair amounted to $39.27, and was met by the contributions of our villagers. The expenses of the Club during the year, for rent and necessary expenses, is $33.67. And who is there amongst us, that has derived pleasure or profit from the same, and yet stands back from contributing his mite of fifty cents to aid on such a notable effort to benefit community?

I wish that some of the questions addressed to our Club, by the Commissioners of Patents, may stir us up to more energy and enlargement of mind, that will enable us to leave posterity a good foundation to rear such a substantial edifice that shall be as enduring as time will allow it to be.

Gentlemen, I would ask, what has been the practical benefits derived the past year from our labors? Much, no doubt, in the improvement of

farms; but has the improvement mentally been as proportionate as it should be? Is there that just support given to the agricultural journals that such a society as ours ought to give? If not, let it now be done. Let agricultural knowledge increase. Let it be generally disseminated. To do so, let all aid, and let that aid be discriminating. Support the practical and most useful. Money so spent will be like manure well applied—productive of great good; and the satisfaction in having done the duty of good citizens and true patriots, will be immeasurably great.

With these remarks, gentlemen, and a wish for the continued prosperity of the Club, thanking you for your kind forbearance with my many failings, and a hope that the duties of the office that I have filled for many years, and ever since the present association was formed, may be better performed in future than has been done, I will close my remarks, merely stating that though I have failed in action often, my intentions ever were the good of the Club. May those that fill the office in future, go through the arduous duties that I have, and retire with as clear a conscience as I do. Farewell.

W. M. BEAUCHAMP.

The following persons were elected officers for the year:

W. J. Townsend, Treasurer: W. M. Beauchamp, re-elected Secretary; L. W. Cleaveland, President of the fair; Russel Frost, 1st Vice-President; Joab L. Clift, 2d Vice-President; G. H. Bently, H. Ellery, W. E. Clark, J. H. Allen, W. Clift, Edward Shepard, H. Fulton, J. Davey, Jr., and Dorr Austin, Directors.

Tonawanda Valley Agricultural Society.—The executive committee of the Tonawanda Agricultural Society and Farmers' and Mechanics' Association, most respectfully submit for your consideration, this their third annual report.

This society is located in the valley of the Tonawanda creek, embracing within its territory parts of Wyoming and Genesee counties; and some part of Erie county has also participated in the expenses and benefits of the society. The origin of this association may be traced to the peculiar location of the territory embraced within its limits—if, indeed, it may be said to have any limits, for the premiums are open to all competitors, and members and exhibitors are not confined to any location. Wyoming county is watered by two considerable streams; Allen's creek, running through a beautiful valley in the eastern part of the county, and the Tonawanda, through an equally beautiful valley in the western, with a very elevated ridge of land between the two. The county fairs are permanently held at Warsaw, in the eastern valley, and the western towns, bordering upon the Tonawanda, labor under great disadvantages and discouragements in any attempts they may make to aid the county society. Some portions of Genesee county labor under the same disadvantages. It was under these circumstances that this society was organized, in July, 1856.

The annual fairs have, thus far, been held in the village of Attica, Wyoming county. This place is situated fifteen miles from the fair grounds in Wyoming county, twelve miles from the fair grounds in Genesee county,

and thirty from those in Erie county. It is plain that this area of territory cannot be well accommodated at either of the above places; and as these fairs are now all *permanently located*, there is no prospect of ever having them nearer.

The valley of the Tonawanda, and including the valley of the Little Tonawanda, is a beautiful and fertile portion of Western New York, with a thriving, industrious and intelligent population, and capable of supporting a large and healthy agricultural organization, without trenching upon territory convenient to any county society.

The regulations of the society are such as to admit members from any location, without regard to town or county lines, and consequently members may be found in every direction and from all distances.

This society, since its organization, has been exceedingly flourishing, and every year has increased in the number and variety of articles and animals on exhibition, in the number of persons in attendance, and in increasing usefulness and interest.

The annual show and fair, was held in the village of Attica, on the 22d and 23d of September, 1858, and was, in every respect, a decided success. The grounds upon which the fairs have been held, are very convenient and beautiful. A lot of fifteen or twenty acres, with a beautiful grove of forest trees in the center, with plenty of shade and water, and the whole surrounded by a fine, wide carriage track, just one-half a mile in length, constitutes one of the most desirable *natural* locations for a fair in the State. The depot of the New York Central, the Buffalo, New York and Erie, and the Hornellsville railroads, are all within a few rods, and in full view, of the grounds, and makes this point very accessible from every direction.

The number and quality of animals on exhibition, would have been creditable to any county fair, and exceeded, both in number and excellence, many of the county fairs in Western New York. The articles in the *tent*, were numerous and beautiful, and showed great skill and taste in their manufacture. The ladies exhibited great energy and perseverance in carrying out that part of the programme assigned to them. The society is indebted in a great measure for its prominence and success, to the deep interest which the ladies have taken in its behalf. Without their kind regard, and fostering care, the society could not have accomplished its mission so fully and satisfactorily to all.

Many of the ladies joined in the equestrian exercises of the day, and by their dashing, fearless and beautiful style of riding, drew forth the most spontaneous bursts of approbation and eclat.

An address was delivered upon the second day, by the Hon. Jas. O. Putnam, of Erie, replete with research, eloquence, and sound, practical common sense views. It was listened to by a large, appreciative audience, and was received with that marked attention which a subject so well considered and so well expressed, really deserved.

The society is under lasting obligations to Mr. P., for the essential aid which his address rendered to the cause of agriculture in Tonawanda valley,

as well as for the impetus it gave the society, in its great endeavor to do good.

The society has been able, during the year, to purchase a large and commodious *tent*, (100 by 32 feet,) which was filled to overflowing, with the handiwork of the ladies, vegetables, fruits and flowers. No better evidence of the interest manifested in the welfare and success of the society can be given, than the large attendance of the people, on both days of the fair, averaging from 8,000 to 10,000, through both days, continuing with increased and increasing interest, during the whole time. Diplomas have been awarded for animals and articles of superior excellence.

The constitution requires quarterly meetings of the society, and provides for monthly meetings, which have been held during the winter months, when practical agricultural subjects have been discussed, and great good has been the result.

The whole amount of money received into the treasury, for 1858, was		$444 60
Whole amount disbursed,		443 44
Paid out for premiums,	$158 25	
do tent,	175 00	
do incidental expenses,	110 19	
Cash on hand,		$1 16

Besides about $100 of voluntary labor, in preparing grounds, making track, &c.

In addition to this, we have paid a great many premiums in agricultural books; for which, among others, we thanfully acknowledge the receipt of several parcels of agricultural books from the State Society. These books have rendered an essential service, in paying premiums, and spreading useful knowledge among farmers.

The officers of the society, are Alden S. Stevens, President; F. R. Wright, Treasurer; Silas Folsom, Recording Secretary; E. Bishop, Corresponding Secretary; seventeen Vice-Presidents, (one from each town represented,) which constitute the Executive Committee; and a General Committee, of one from each school district, to see to the local affairs of the society.

A. S. STEVENS, *President.*

EZRA BISHOP, *Cor. Sec'y.*

F. R. WRIGHT, *Treasurer.*

UNION AGRICULTURAL SOCIETY, PALMYRA, WAYNE CO.—REPORT OF THE CORRESPONDING SECRETARY.—*Mr. President and Gentlemen of the Society*—In accordance with the directions given at the last annual meeting, held in February, 1858, the board of managers designated the 2d and 3d days of July, for an exhibition of horses and sheep. A circular letter was prepared by order of the board of managers, and sent to about one thousand persons residing in the vicinity, who, it was supposed, might be induced to take an interest in the exhibition, inviting their

favorable notice, and urging their attendance. The weather was propitious, and the attendance, although not as large as at the semi-annual fair of 1857, was creditable to the society. The horses on exhibition were pronounced by competent judges to be of superior quality, and the trials of "speed and action" were such as to gratify every lover of that noble race of animals. So far as sheep were concerned, the exhibition was a complete failure. It was too late to exhibit sheep with their fleeces on, and farmers were unwilling to show their stock so soon after shearing.

The whole number of entries was 73, and the money received amounted to $311.00, and the premiums awarded to $303.00. The incidental expenses of that exhibition amounted to a little less than $60.00.

It is proper to remark in this place, that from the winter and spring floods, much damage had been done to the grounds of the society; the bridges had been swept away, and the fences injured. The necessary repairs and improvements deemed important, were made under the dictation of a committee appointed for that purpose at the last annual meeting, the total expense of which amounted to about $250.00. The fences were restored, the bridges rebuilt, the grounds thoroughly drained, the approaches to the grounds fenced, the trotting course more perfectly graded, and enclosed with posts and rails, out-houses erected and other improvements effected.

At the last annual meeting the treasurer reported that the entire indebtedness of the society, beyond its means on hand, was about $38.00. This was predicted upon the supposition that all the notes taken for life-membership, remaining then unpaid, were good, but it has since been found that a portion of these could not be made available at present. Add to this the fact that several bills have since been presented, of which the treasurer at that time knew nothing, and we have an explanation of the society's being more indebted than its members had reason to suppose.

As soon as the true state of the case was known, the managers resolved to ask the consent of the members to change the rules of the society, for the fall fair only, so that all life-members, as well as others, should be subject to certain charges, hoping thereby to realize a sum sufficient to meet the indebtedness, pay the rent, and leave the society unencumbered. But the members generally were averse to the measure, and it was abandoned.

A general meeting was called, and although numerously attended, nothing effectual was done. Under these circumstances, the managers felt constrained to cut down the premium list about one-third; and to adopt a system of checks for the admission of persons to the grounds, so as to make sure that none except those entitled to the privilege, entered without payment of the admission fee.

The annual fair, held on the 15th, 16th and 17th of September, opened unpropitiously, the weather was such as to prevent very many from entering stock and articles for exhibition, and although the 2d and 3d days were fair, it was too late to make up for the loss of the first day.

The show in floral hall was exceedingly meager, and the department of agricultural implements was not patronized to such an extent as would have been creditable to the society. The stock exhibited was generally of a very superior quality; the Durham cattle, to say the least, equalled any that were exhibited at the State fair. A large number of very fine grade cattle were entered, and these, together with several choice lots of sheep and swine, made this part of the exhibition unusually attractive.

Some of the officers of the society having elsewhere witnessed the effect of a balloon ascension in collecting a large number of people, conceived a plan by which the society would be largely benefitted, without incurring but little if any expense. A subscription was started to pay the expense of a balloon ascension, and nearly enough was subscribed to meet the charge. An arrangement was then made with Prof. Steiner, of Philadelphia, to make an ascension from the fair ground, and notices to that effect distributed. On the day fixed for the ascension, a large concourse of people assembled only to be disappointed. In consequence of a series of misfortunes, Prof. Steiner was unable to fulfill his engagement; a failure regreted by none more than by those officers and friends of the society through whom the arrangement was made—although they respectfully submit that the failure and consequent disappointment of the people, could not be justly charged to them. They acted in good faith, looking solely for the interest of the society, and had fortune favored the undertaking, the result there is every reason to believe, would have been entirely satisfactory.

The receipts at the annual fair amounted to about $600.00, while the premiums awarded, to about $300.00. The rent of the grounds was paid, and the balance of money used in liquidating the more pressing demands against the society. These matters, and the present indebtedness—amounting to about $370.00—will more fully appear from the report of the treasurer. What means shall be taken to pay off the present debt, the secretary will not undertake to say. The whole subject will doubtless receive the calm consideration of the members of this association, than whom as a body, none are more sagacious or better fitted to cope with the embarrassments under which we are laboring. If the society can be made self-sustaining, it is all that experience and observation have taught us can be done.

Let the society be relieved from debt and from the annual charge of about $230.00 now paid for rent of grounds, and there can be no doubt but what it will sustain itself, and prove a source of great advantage to the entire section embraced within its borders.

To do this two objects must be steadily kept in view. First, and by far the most important, to make the exhibition interesting and profitable to farmers and mechanics. Should every farmer within the sphere of this society, who has stock of a superior quality, put the same on exhibition, it would not be long before a friendly emulation would excite a spirit of improvement that would redound to the great advantage of the entire com-

munity, and it might be well to give greater prominence to this department, than has heretofore been done. And so would it be with regard to raising crops, if the maxim be just, that one acre well tilled is more profitable than two acres only half cultivated. Science is now extensively applied to agriculture, and where too much experimenting is not practiced, results show that the productiveness of the land can be largely increased. Our farmers possess a soil that is second to none; they have not, as in many portions of our country, less favored, in the first place, to make, as it were, the land, and then till it; they start with every natural advantage, and if they treat their land kindly, and give to the powers of nature a skillful direction, they will not fail to reap corresponding benefits. And in respect to mechanical skill, whether in the manufacture of agricultural implements or other articles of utility, the advantages arising from viewing side by side, the productions of many minds and of many hands, is equally apparent. How much has society been profited by modern invention, yet invention is but little more than a skillful combination of principles before known; and where can the artizan or mechanic so successfully study these principles as in an exhibition where they are shown in various stages of development in tools, implements, machinery, and whatever else conduces to the convenience and comfort of man.

He who patronizes an agricultural society merely for the money he expects to draw as a premium, has failed to see the great object for which these institutions were established. The enlightened farmer and mechanic perceive in them, sources of advantage far beyond the money premium; ultimate blessing to society as well as profit to themselves.

These agricultural fairs tend largely to make labor respectable, and in this respect they are deserving of every encouragement. History shows us that as nations become rich, the youth, more and more, evince a disinclination to engage in manual labor; and it may not be improper to ask if our own country, nay, even our own immediate neighborhood, does not show this disinclination to a certain degree? And from whence does this spring, except that other occupations have been regarded as more honorable than the cultivation of the soil, and the workshop of the artizan?

Let us sustain our agricultural societies, make their exhibitions full and interesting, and the rising generation will learn to respect and honor that which they see the people honor.

The second object before alluded to, that should not be lost sight of, is to make our fairs attractive to those who are not members, and those who care little about cattle and horses, and whatever else make up the outdoor exhibition. There are various ways in which this can be partially accomplished. Farmers' wives and daughters can bring the products of the dairy and the loom, the fruits and flowers of the garden, and tasteful specimens of their own handiwork. Who has not observed how much it adds to a fair to have floral hall decorated with wreaths and flowers, and filled to repletion, and mostly by the products of female taste and skill? Many societies are introducing for the purpose of increased attraction,

gymnastic sports, such as try the nerve and muscle of young men, and when not carried too far, they may prove decidedly useful.

But on these themes it is not proper in this place to enlarge. There are a variety of topics that might well be mentioned, but the limits of this report will not permit.

In taking leave of you, officially, the secretary craves your indulgence. When he assumed the office, he knew nothing of the duties he was expected to perform; nor would he have consented to act in that capacity, if he had realized the grave responsibilities thrown upon him. The mistakes he has made arose from a too ardent desire to serve you and the society, and should be set down solely to his want of experience in this field of labor. Hoping that you will find a successor who will serve you more acceptably, he trusts the Palmyra Union Agricultural Society will bear its full share in diffusing throughout the community, the blessings of enlightened labor.

ORNON ARCHER.

PALMYRA, *March* 5, 1859.

UNION AGRICULTURAL SOCIETY.—At an adjourned annual meeting of the Palmyra Union Agricultural Society, held in Palmyra, March 5, 1859, the president in the chair, the reports of the corresponding secretary and treasurer were read, accepted, and ordered on file.

Mr Ornon Archer offered the following resolution:

Resolved, That the rules of the society be so amended, that hereafter, life members, annual members, and all other persons, offering stock or other articles for exhibition, at any of the fairs of this society, shall pay, as an entrance fee, twenty per cent on the amount of premiums for which they shall severally compete.

Wm. F. Aldrich moved to amend said resolution, by adding thereto the following words:

"But in case persons to whom premiums shall be awarded, shall signify to the secretary that they will donate to the society such premiums, a certificate of such awards shall be delivered to them, and the amount of money paid by them severally, as entrance fees, shall be refunded."

The president put the question on the amendment of Mr. Aldrich, and it was decided in the affirmative.

The president then put the question on the resolution of Mr. Archer, as amended, and it was decided in the affirmative.

The society then proceeded to elect its officers for the ensuing year. On counting the ballots cast for president, it appeared that a majority of all the votes cast had been given to Luther Sanford, Palmyra; whereupon he was declared duly elected. In like manner, the following gentlemen were duly elected vice-presidents:

W. P. Nottingham, Palmyra; Eliab Yeomans, Walworth; Lorenzo Hathaway, Farmington; Russel Stoddard, Manchester; George W. Marshall, Macedon; Elihu Durfee, Walworth; Sam. H. Duel, Ontario.

Corresponding Secretary—Carlton H. Rogers.

Recording Secretary—A. P. Crandall.

Treasurer—George W. Cuyler.

S. K. Williams, of Newark, and J. C. Petitt, of Palmyra, were elected directors for the ensuing three years, and Lemuel Durfee, of Macedon, to fill the vacancy occasioned by the death of A. H. Cooper.

Mr. S. K. Williams, from a committee heretofore appointed for that purpose, made a verbal report in regard to raising means to purchase the grounds now held by the society, under lease with privilege of purchase.

Report accepted, and the committee directed to report it in writing, and transmit to the board of managers.

WILSON FARMERS' CLUB, NIAGARA CO.—B. P. JOHNSON, *Secretary:* Dear Sir—On the 25th of October, 1858, pursuant to public notice, some of the inhabitants of school district No. 2, of Wilson, Niagara Co., formed an association "for the purpose of uniting our efforts for mutual improvement in the science and art of agriculture in all its departments, by discussions, conversations, comparing notes, relating experiences, addresses, &c.," by the name of "Wilson Farmers' Club, of School District No. 2."

According to our constitution, the *annual* meetings are held on the last Monday evening of October in each year, and our *regular* meeting on each alternate Monday evening thereafter, until the first week in April, and once a month during the more busy portion of the year, till the next annual meeting, "at the district school-house, or at such other time and place as the club shall direct."

We have held weekly meetings a portion of the past winter, all of which have been interesting and profitable.

In addition to the usual discussions, we have had an address on some agricultural or horticultural subject about once in two weeks.

The officers of the club for the present year are, E. S. Holmes, President; Wm. O. Pettit, Vice-Pres.; James G. O. Brown, Sec. and Treas.

The following is a synopsis of the doings our club to this date. I will premise by saying that after each question has been discussed, each member present records his vote thereon in the secretary's book; and also that the questions and the votes thereon are considered as relating more particularly to this immediate neighborhood.

The first question discussed was, Is the keeping of *fine wooled* sheep the most profitable for farmers? Vote affirmative, unanimous.

2d. Is autumn the best time for transplanting fruit trees? The votes on this question were nearly equally divided.

3d. What kinds of apples are most profitable for farmers to raise for market? The following three lists were given by different members of the club, viz: 1st. Sweet Bough, Early Harvest, Holmes' Sweet, Tallman Sweet, Baldwin, Roxbury Russett, Greening, Esopus Spitzenburgh, King of Tompkins County. 2d. Sweet Bough, Sour Bough, (?) Fall Pippin, Fall Jeneating, Baldwin, King of Tompkins County, Greening, Tallman Sweet. 3d. Golden Sweet, Holmes' Sweet, Jeneating, Baldwin, Greening, Roxbury Russett, Golden Russett, Tallman Sweet.

4th. What is the best method of preparing the soil and transplanting

trees and vines? Vote unanimous, as follows: 1st. Care should be taken in taking up the trees, so as not to injure them in any respect, and especially to preserve as many of their rootlets as possible. 2d. Leave the roots exposed to the air as little as possible. 3d. See that the soil is thoroughly surface and under-drained, either naturally or artificially. 4th. Prepare the soil by deep cultivation, say two feet, not only mixing the surface and under-soils together for a year or two before planting, but also mixing with it well decomposed manure, or compost. Then stake out the rows accurately, straight every way, and dig the holes sufficiently large and deep to admit the roots without cramping or crowding them, but never deeper than the soil is drained and cultivated, and set the trees with great care so that the roots will occupy as nearly their natural position in the soil as possible.

5th. What kinds of stock are most profitable to raise? The following lists were given by different members, part of those present not voting, viz: 1st. Horses, neat cattle, sheep and hogs. 2d. Sheep. 3d. Sheep, cattle and hogs. 4th. Cattle, sheep and hogs. 5th. Horses, cattle, hogs and sheep, all in the order as named.

6th. Is it advisable for us to adopt a system of mono-agriculture instead of mixed-agriculture, as is now generally practiced? Two of the members present voted in the affirmative and six in the negative.

7th. When is the best time to prune fruit trees? Two votes for August and September, to promote the growth of wood, and summer pinching to promote the growth of fruit. One vote, summer pinching to promote the growth of fruit. 1 vote, from 20th Jan. to 20th of Feb. 1 vote, any time.

8th. Is under-draining stiff clay soil practicable? Affirmative, unanimous.

9th. What is the best system of training and pruning the vine? Vote of nearly every member present was, prune on the long cane renewal system, and train to trellis, as recommended by Mr. Hoar.

10th. What is the best distance apart to plant grape vines? All were in favor of wide planting, but the following distances had their advocates, viz: 10x10 feet, 12x12 feet, 10x12 feet, and 10x20 feet.

11th. With what preparation, if any, and at what time should clover and grass seed be sown, and what quantity per acre? After the discussion of this question, the votes cast were as follows, viz: 1st. Prepare the clover seed by moistening it, then drying it off with gypsum; sow immediately after the main crop in spring; roll it in; ten pounds per acre. 2d. Sow on winter grain when the ground is honey-comed by frost; spring grain same as the first, except to plaster after seeding. 3d. One bushel clover and one bushel timothy seed, mixed, to eight acres, after spring grain, same as first, except to rain it in. 4th. On spring grain same as first; for clover, for mixed clover and timothy, two bushels to ten acres, and plaster after sowing. 5th. Same as first for clover, except to sow seven and a half pounds per acre, and mixed seed same as fourth. 6th. Sow dry on winter grain in March; on spring grain as fifth, and quantity do. The other votes agree in the main with the last.

12th. What constitutes first rate grape cuttings, what second do, and

what is the best manner of setting them? Vote, first rate, well ripened one year old wood, with not less than six good eyes, fifteen inches long, and with a heel of old wood, cut close to the heel bud, and two or three inches above the top eye; second rate, well ripened wood, with not less than four good eyes from fifteen to eighteen inches long, cut as above. Set in good garden mold in rows 20 inches apart, and 12 inches distant in the rows, at an angle of 45° with horizon. Nearly all concurred in the above, except that some thought the cuttings might be placed four inches apart in rows.

13th. Will it pay to save all refuse matter, animal and vegetable, all animal excrement and night-soil, both solid and liquid, to be applied to the farm as manure? In the discussion of this question the *expense* of the necessary fixtures and absorbents were taken into consideration, and the vote was unanimous in the affirmative.

WILSON, *Niagara Co., N. Y.*

Officers Town Agricultural Societies from which detailed reports were not furnished.

Name of Society.	Counties.	President	Secretary.	Treasurer.
Afton,	Chenango,	P. Northrup,	Wm. Beatman,	Geo. Landers.
New Albion,	Cattaraugus,	H. C. Young,	James H. Jewel,	J. Jewel.
Bedford,	Westchester,	J. J. Wood,	J. S. Holmes,	A. F. Dickinson.
Bainbridge,	Chenango,	Ira Hyde,	J. Juliand, 2d,	J. Juliand, 2d.
Brookfield,	Madison,	W. Delaney,	J. F. G. Bailey,	C. Whitforn.
Camden,	Oneida,	H. Dunbar,	H. F. Curtiss,	A. W. Ransom.
Canaan,	Columbia,	S. A. Barstow,	J. Vanderburgh,	E. Kellogg.
Caneseraga,	Allegany,	W. M. White,	G. A. Sanders,	J. L. Embress.
Cazenovia,	Madison,	E. S. Jackson,	L. W. Ledyard,	C. L. Chappel.
Chautauque,	Chautauque,	A. S. Moss,	J. C. Mullett,	E. Baker.
East'n Chautauque	do	N. M. Carpenter,	A. S. Brown,	A. Bagg.
Conewango,	Cattaraugus,	A. Crowley,	J. Sibley,	D. Bowen.
Constantia,	Oswego,	Sereno Clark,		
Coventry,	Chenango,	F. Martin,	M. S. Parker,	D. Beecher.
Danby,	Tompkins,	S. D. Beers,	E. L. B. Curtis,	S. Foster.
Ellisburgh, Adams and Henderson,	Jefferson,	S. Mather,	C. Littlefield,	A. W. Ingraham.
Fenner,	Madison,	G. W. Hyatt,	W. P. Lounsbury,	W. P. Lounsbury.
Farmers' Club, Little Falls,	Herkimer,	John Merkel,	L. B. Arnold,	P. Reed.
Galen,	Wayne,	A. Weed,	Joseph Watson,	T. Plumtree.
Gorham,	Ontario,	W. J. Dixon,	J. H. McPherson,	A. Root.
Hamilton,	Madison,	P. H. Smith,	G. F. Burr,	D. B. West.
Harpersfield,	Delaware,	R. E. Davis,	M. S. Wilcox,	M. S. Wilcox.
Jefferson,	Schoharie,		R. Shelmardine,	
Lebanon,	Madison,	F. H. Ingalls,	E. B. Niles,	B. C. Bristol.
Lenox,	do	R. F. Avery,	I. N. Messenger,	T. F. Hand,
Leon,	Cattaraugus,	C. Morgan,		
Nelson,	Madison,	N. Westcott,	John James,	C. H. Clark.
Ossining,	Westchester,	D. K. Sherwood,	H. C. Vail,	C. A. Fowler.
Perry and Castile,	Wyoming,	A. Palmer,	S. M. Howard,	R. Mordoff.
Rushville,	Yates,	A. S. Thomas,	G. W. Stearns,	C. D. Castle.
Sandy Creek,	Oswego,	O. R. Earl,	E. H. Sergeant,	J. Davis.
Sangersfield & Marshall,	Oneida,	S. Clark,	G. H. Church,	D. B. Goodwin.
Susquehanna Valley,	Otsego,	D. Lee,	P. P. Rogers,	C. J. Hayes.
Union,	Monroe,	E. B. Holmes,	H. W. Beach,	T. Carnes.
Union,	Tompkins, Schuyler and Seneca,	N. Halsey,	S. H. Owen,	N. Noble.
Union,	Orleans,	H. Bowen, Jr.,	E. F. Brown,	G. T. Anthony.
Vernon,	Oneida,	E. Wilson,	L. T. Marshall,	
Victory,	Cayuga,	P. Camp,	D. L. Halsey,	J. F. Gregory.
Virgil,	Cortland,	M. Luce,	W. A. Wood,	Asa Price.
Wiskoy,	Wyoming,	M. A. Hall,	C. Stebbins,	J. Renwick.
Yates,	Orleans,	G. Clark,	C. H. Lum,	N. P. Johnson.

TREASURER'S REPORT.

LUTHER H. TUCKER, *Treasurer, in account with the New York State Agricultural Society.*

1858.			*Dr.*
Feb. 12.	To cash from B. B. Kirtland, late treasurer,.....		$310 11
	To Mr. Kirtland's note for balance,....	$891 80	
		310 11	
	Total, ...	$1,201 91	
	To cash for memberships at annual meeting,.....		164 00
	To cash from A. H. Shultz—a part of the society's investment, ...		1,000 00
Mar. 30.	To cash from State appropriation, 1857, ...		700 00
April 3.	To cash from B. B. Kirtland—instalment on note,		125 45
May 19.	To cash from A. H. Shultz—total balance with interest, ...		1,075 06
Aug. 30.	To note discounted,.....		793 35
Oct. 2.	To cash from Syracuse local committee, ...		1,200 00
8.	To receipts for entries at Syracuse fair,	$1,556 50	
	To receipts from tickets, &c,.....	9,259 31	
		10,815 81	
	Deduct for exchanges, &c.,.....	9 53	
			10,806 28
	To cash for copies Fitch's reports, ...		15 00
Nov. 10.	To cash State appropriation, 1858, ...		700 00
	To cash returned for premium overpaid,.....		1 00
	To cash for rent of grounds at Syracuse,.....		400 00
1859.			
Jan. 25.	To cash from Comptroller — being one quarter's salary for Dr. Fitch, Oct. 1, 1858, to Jan. 1, ...		250 00
29.	To cash from B. B. Kirtland, in full for his note and interest, ...		816 02
			$18,356 27

		Cr.
By expenses at winter meeting,	$46 79	
By premiums at winter meeting,	460 00	
		$506 79
By expenses and premiums paid on account of Buffalo and previous fairs,		564 99
By salaries of secretary, assistant, treasurer, and traveling expenses,		2,943 71
By salary paid to Dr. Asa Fitch,		750 00
By library and museum expenses,		154 42
By printing, advertising, and stationery account,		604 65
By postage account,		204 39
By incidental expenses,		230 63
By premiums and premium expenses,		5,809 60
By expenses of Syracuse fair, viz: superintendents,		717 25
By clerks in business and treasurer's office, with committees and in buildings,		857 50
By gate-keepers and guards,		344 00
By watchmen and policemen,		175 50
By additional erections,		239 75
By refreshments for judges, guests, &c.,		400 00
By miscellaneous expenses,		403 76
By payment of note discounted August 30,		798 40
Total,		$15,705 34
By cash on deposit in Albany Exchange Bank,		2,650 93
		$18,356 27

We hereby certify that we have examined the account presented, and the vouchers accompanying the same, and find the same in all respects just and true.

February 8, 1859.

W. T. McCOUN, *President.*
B. P. JOHNSON, *Secretary.*
C. S. WAINWRIGHT, } *Auditing Com.*
S. CHEEVER, }

A full and detailed statement of the above accounts, verified by vouchers, filed with the Comptroller as required by law.

L. H. TUCKER, *Treasurer.*

AWARD OF PREMIUMS.

NEW YORK STATE FAIR, SYRACUSE, OCTOBER 5, 6, 7, 8, 1858.

CLASS I.—CATTLE.

No. 1. Short horns—bulls.

Best bull, 3 years and upwards, E. Cornell, Ithaca, "Duke of Oxford," $25
And a silver medal to breeder, L. G. Morris, Fordham.
2d best, James F. Converse, Woodville, "Robinhood,"..... 10
3d best, D. Rowley & Co., Cortland,..... 6
Best bull, 2 years old, C. J. Chaddock, "Perfection," Pavilion Center, Genesee county,..... 20
2d best, J. R. Page, Sennett, "Hiawatha,"..... 15
3d best, N. Oaks, Oaks Corners, "Pilot,"..... 5
Best bull, 1 year old, Samuel Thorne, Thornedale, Dutchess, "Prince of Oxford,"..... 15
2d best, E. Sheldon, Sennett, Cayuga,..... 10
3d best, H. S. Tryon, Fleming, Cayuga,..... 5
Best bull balf, E. Marks, Camillus, "Mark Anthony,"..... 5
2d best, W. Hurst, "Nymph's Marmion," Albany,..... Trans. and 3

IMPORTED BULLS.

Best bull, three years and upwards, W. H. Slingerland & Co., Albany, "Neptune,"..... 25
Best bull, 2 years old, James O. Sheldon, White Spring Farm, Geneva, 20

No. 1 a. Short horns—cows.

Best cow, 3 years old and upwards, Samuel Thorne, Thornedale, Dutchess, "Clover,"..... 25
And a silver medal to breeder, Samuel Thorne.
2d best, Samuel Thorne, Dutchess, "Mrs. Gwynne."..... 15
3d best, J. K. Tucker, Buffalo, "Lilly,"..... 5
Best heifer, 2 years old, G. Butts, Manlius, "Bright Eyes 6th,".... 20
2d best, E. Marks, Camillus, "Minehaha,"..... 10
3d best, do "Roan Nelly,"..... 5
Best heifer, 1 year old, Samuel Thorne, Dutchess "Favorita,"..... 15
2d best, T. Richardson, West Farms, Westchester, "Fuchia,"..... 10
3d best, W. Hurst, Albany, "Dutchess Eryholmn,"..... 5

Best heifer calf, E. Cornell, Ithaca, "Bright Eyes 8th,"..... $5
2d best, A. B. Benham, McLean, Tompkins, "Oxford Maid," Trans. and 3

IMPORTED COWS.

Best cow, Wm. H. Slingerland & Co., Albany, "Finela,"..... 25
Best heifer, 2 years, Thomas Richardson, West Farms, "Lady Constance,"..... 20

No. 2. DEVON BULLS.

Best bull, 3 years and upwards, F. H. Ellsworth, Canaan, ... 25
And silver medal to breeder.
2d best, R. E. & C. Mills, Amber,..... 15
3d best, J. S. Eastman, Waterville, "Monarch,"..... 5
Best bull, 2 years, Baker & Son, Earlville, "Frank Morris,"..... 20
2d best, J. S. Eastman, Waterville, "Oneida Chief,"..... 10
3d best, Moses Parsons, Skaneateles, "Powhattan,"..... 5
Best bull, one year, C. S. Wainwright, "The Meadows," Rhinebeck, "Sagamore,"..... 15
2d best, E. G. Faile, West Farms, "Toronto,"..... 10
3d best, J. W. Collins, Sodus,..... 5
Best bull calf, E. G. Faile, West Farms, "Cayuga,"..... 5
2d best, J. Hilton, Albany, "Empire 2d,".....Trans and 3

Joseph Hilton, Albany, bull "Empire," awarded first prize at Buffalo, is now awarded certificate as best Devon bull exhibited.

Discretionary premium of $5 awarded to John R. Chapman, of Oneida Lake, on yearling bull, "Master Quartly."

IMPORTED BULLS.

Best bull, E. G. Faile, West Farms, "Exeter,"..... $25
Best bull, two years, C. S. Wainwright, "The Meadows," Rhinebeck, "Hiawatha,"..... 20

No 2 A. DEVONS—COWS.

Best cow three years and upwards, John Corp, Freetown, "Fancy,". 25
And silver medal to breeder, E. G. Faile.
2d best, Baker & Son, Earlville, "Jenny Lind 2d,"..... 15
3d best, Baker & Son, Earlville, "Jenny Lind,"..... 5
Best heifer, two years, Enoch Ottley, Phelps, "Blossom,"..... 20
2d best, C. S. Wainwright, "The Meadows," Rhinebeck, "Helena,". 10
3d best, E. G. Faile, West Farms, "Paunee,"..... 5
Best heifer, one year, C. S. Wainwright, "The Meadows," Rhinebeck, "Eva,"..... 15
2d best, Joseph Hilton, Albany, "Empress,"..... 10
3d best, Joseph Hilton, Albany, "Belle,"..... 5
Best heifer calf, C. S. Wainwright, "The Meadows," "Zerlina,".... 5
2d best, E. G. Faile, West Farms, "Zenia,".....Trans. and 3
Three-year old heifer, Ambrose Stevens, Batavia, special premium,.. 25
Imported, best cow, E. G. Faile, West Farms, "Titania,"..... 25

No. 3. Herefords.

Best bull, three years and upwards, W. A. Mills, Mt. Morris, ... $25
2d best, M. C. Remington, Sennett, ... 15
3d best, A. & H. Bowen, Jr., Oak Grove, "Cayuga Chief,"..... 5
Best Bull, two years, E. Corning, Jr., "Major,"..... 20
2d best, M. C. Remington, Sennett, ... 15
Best bull, one year old, M. C. Remington, Sennett,..... 15
2d best, one year old, M. C. Remington, Sennett,..... 10
3d best, one year old, A. & H. Bowen, Jr., Medina, ... 5
Best bull calf, A. & H. Bowen, Jr., Oak Grove, ... 5
Best cow, three years and upwards, E. Corning, Jr., Albany, "Victoria 4th," 25
2d best, A. & H. Bowen, Jr., Oak Grove, "Young Matchless," 15
3d best, M. C. Remington, Sennett, ... 5
Best heifer, two years, A. & H. Bowen, Jr., Oak Grove, "Coquette," 20
2d best, M. C. Remington, Sennett, ... 10
Best heifer, one year old, E. Corning, Jr., Albany, "Grace 2d,"..... 15
2d best heifer, one year, A. & H. Bowen, Jr., Oak Grove, "Myrtle," 10
3d best, E. Corning, Jr., Albany, "Cora 3d,"..... 5
Best heifer calf, E. Corning, Jr., Albany, "Grace 3d," 5
2d best, M. C. Remington, Sennet,.....Trans. and 3

Cow "Grace 1st," E. Corning, Jr., certificate, and cow "Woodbine," A. & H. Bowen, Jr., certificate.

IMPORTED BULLS.

Best bull, two years old, E. Corning, Jr., "S. Godard,"..... $20
Best bull, one year old, E. Corning, Jr., "Duke,"..... 15

IMPORTED COWS.

Best cow, three years and upwards, E. Corning, Jr., Albany, "Lady Godard," 25
Best heifer, two years, E. Corning, Jr., Albany, "Cora 2d,"..... 20
Best heifer, one year, E. Corning, Jr., Albany, "Flora 2d," 15

Erastus Corning, Jr., Albany, exhibited cow "Grace," and A. & H. Bowen, Jr., of Medina, cow "Woodbine," each entitled to commendation, having previously received the first prize.

No. 4. Ayrshires.

Bulls, three years old and upwards, 3d premium, George Kerr, Auburn,... ..... $5
Best bull, one year old, S. D. Hungerford, Adams,..... 15
Best bull calf, S. D. Hungerford, Adams,..... 5
2d best, S. D. Hungerford, Adams,.....Trans. and 3
Best cow, three years old and upwards, J. F. Converse, Woodville,.. 25
2d best, J. F. Converse, Woodville, ... 15
Best heifer, one year old, J. F. Converse, Woodville,..... 15
2d best, Jas. Brodie & Co., Ellisburgh,..... 10
S. D. Hungerford, Adams, "Bessy," prize cow, best shown,...Certificate.

IMPORTED COWS.

Best, James Brodie & Co., Ellisburgh,..... $25

No. 11. Grade cattle—cows.

Best cow, three years old and upwards, Wm. Hurst, Albany,..... $25
2d best, Gill Brothers, Henderson, ... 15
3d best, S. A. Winslow, Bristol,..... 5
Best heifer, two years, Gill Brothers, Henderson,..... 20
2d best, Gill Brothers, Henderson, ... 10
3d best, Elon Sheldon, Sennett,..... 5
Best heifer, one year old, S. Winslow, Bristol,..... 15
2d best, A. B. Benham, McLean, ... 10
3d best, Gill Brothers, Henderson, ... 5
Best heifer calf, Wood & Eastman, Woodville, ... 5
2d best, C. J. Chaddock, Pavilion Center, Genesee Co.,.. Trans. and 3

No. 12. Natives—cows.

Best cow, three years old and upwards, John Brydon, Kirkland, ... 25
2d best, Wm. Sabine, Onondaga Valley, ... 15
3d best, O. Howland, Auburn, ... 5
Bull calf, five months old, B. F. Scovil, Hadley, discretionary,..... 5

MILCH COWS.

Milch cow, H. N. Boardman, Rushville, 2d premium,..... 10

No. 13. Working oxen over four years.

Best yoke, Wm. Dixon, East Bethany,..... 20
2d best, Elon Sheldon, Sennett,..... 15
3d best, Baker & Son, Earlville,..... 5

DISCRETIONARY, FOUR YEARS OLD.

Best, J. Hilton, New Scotland,..... 10
2d best, M. Roberts, Henrietta,..... 8
3d best, John Brydon, Kirkland, ... 3

Special notice of a fine pair of cattle of Wm. Hurst, Albany; too fat to compete as working oxen.

No. 14. Steers three years old.

Best yoke, D. Osmer, Rutland, N. Y.,..... $10
2d best, Elon Sheldon, Sennett,..... 8
3d best, S. D. Hungerford, Adams,.....Trans. and 3

Discretionary.

Pair half-blood Hereford Steers, three years old, A. & H. Bowen, Jr. Oak Grove, ...S. M.
Devon grade steers, S. D. Baker & Son, Earlville,.....Trans. and $3

No. 15. Steers, two years old.

Best yoke, Norman Kingman, Cortlandville,..... 10
2d best, E. W. Clark, Camillus, ... 8
3d best, Jas. C. Garrett, Salina,.....Trans. and 3

Boys under sixteen years, training yoke of steers, best, John Corp, Freetown, ... S. M.
2d best, A. W. Garrett, Salina, ... Trans. and $2

STEERS, ONE YEAR OLD.

Best yoke, H. DeClerque, Cazenovia, ...
2d best, H. DeClerque, Cazenovia, ... 5
3d best, M. Calkins, Earlville, ... Trans. and 3

No. 16. FAT CATTLE, STALL FED.

Best ox, four years and under five, weight 2,430, James Farthing, Buffalo, ... 12
2d best, James Farthing, Buffalo, weight, 2,470, ... 8
3d best, Elon Sheldon, Sennett, weight 1,960, ... 5
Best cow, four years and upwards, Elon Sheldon, Sennett, ... 10
2d best, O. Howland, Auburn, weight 1,330, ... 6
Best steer, three years old, Elon Sheldon, Sennett, weight 1,863, ... 8
2d best, Elon Sheldon, Sennett, weight 1,610, ... 3
Best heifer, three years old, M. S. Wilcox, Granby, ... 8

Discretionary.

Two four-year old steers, weighing 2,095 and 2,100, Albion Jackson, Onondaga Castle, ... Diploma
Two stall fed oxen, Thomas Kimber, Syracuse, ... Diploma
Two stall fed oxen, Mason Salisbury, Ellisburgh, ... Diploma

No. 17. FAT CATTLE ON HAY AND GRASS.

Best ox 4 years, and under 5, Charles Gere, Geddes, weight 2,240, .. $10
2d best, C. Walker, Byron Center, weight 2,470, ... 6
3d best, A. Jackson, Onondaga Castle, weight 1,833, ... 4
3d best, cow 4 years and upwards, O. Howland, Auburn, ... 4
Best 3 years old steer, C. Walker, Byron Center, weight 1,980, ... 8
2d best, C. Walker, Byron Center, weight 1,925, ... 3

No. 18. FOREIGN CATTLE.

Best Short Horn bull, 2 years and upwards, John Snell, Edmonston, C. W., ... Dip. and 15
Best cow, John Snell, ... Dip, and 15
Best Hereford bull, 2 years and upwards, John Humphreys, Elyria, Ohio, "Prince of Wales," ..... Dip. and 15
Best cow, John Humphreys, Elyria, Ohio, "Victoria," .... Dip. and 15

CLASS II.

No. 19. STALLIONS—ALL WORK.

Best stallion, 4 years old, E. B. Adcock, De Witt, ... 25
2d best, H. Abrams, Jordan, "Silas Wright," 15
3d best, F. Vandenburgh, Rhinebeck, ... 5
4th best, W. L. Adams, Salina, "Consternation," ..... Youatt.

No. 19 A. All work brood mares and foals.

Best brood mare with foal at her foot, four years and upwards, Moses Liddell, LaFayette, ... $25
2d best, S. Pendergrass, Phœnix, ... 15
3d best, Ambrose Stevens, Batavia, ... 5
4th best, S. Pendergrass, Phœnix, ... Youatt.

No. 19 B. Morgan or black hawk stallions.

Best 4 years and upwards, C. J. Hamlin, Buffalo, "Black Hawk Chief," $25
2d best, Joel Turril, Oswego, "Wine Creek Black Hawk," 15
3d best, Ed. Jones, Clyde, "Young Black Hawk," 5
4th best, Charles Russell, Manlius, "Andrew Jackson," ..... Youatt.
N. Farnham, Lockport, "Black Hawk, Jr.," 11 years old, having received a premium heretofore, awarded certificate.

No. 22. Draught.

Best stallion, 4 years and upwards, C. S. Mack, Lockport, "Champion," $25
3d best, C. O. Brundage, South Sodus, "Sir Henry," 15
4th best, Charles Peck, Canal, "American Messenger," ..... Youatt.
Best draught matched horses, S. Warner, Van Buren Center, ... $15
2d best, L. Hiscock, De Witt, ... 10
3d best, J. W. Parsons, South Onondaga, ... Youatt.
4th best, H. Abrams, Jordan, ... Trans.

No. 21. Thorough bred.

Best stallion, 4 years and upwards, J. H. Hawthorn, Utica, "Kimball Jackson," $25
2d best, L. W. Wilkinson, Syracuse, "Young Consternation," 15
Best stallion, 3 years, J. J. Briggs, Salina, "Hamiltonian," 20

No. 22. Three years old.

Best stallion, 3 years old, E. Thomas, Volney, ... 20
2d best, Oliver Cady, Dryden, ... 10
3d best, John Metcalf, Augusta, ... 5
4th best, W. S. Parker, Niles, ... Dadd.

Discretionary.

Pair twin 3 year old geldings, R. R. Burke, Caughdenoy, ... $15

No. 23. Two years old.

Best stallion, 2 years, M. Liddell, La Fayette, ... 15
2d best, C. Wolcott, Trenton, ... 10
3d best, G. Kerr, Springport, ... Dadd.
Best mare, L. L. Howe, Phelps, ... $15
2d best, J. R. Chapman, Oneida Lake, ... 10
3d best, W. W. Davis, Van Buren, ... Dadd.

No. 24. one year old.

Best stallion, J. H. Sanborn, Plattsburgh, ... $10
2d best, H. M. Boardman, Rushville, ... 5

3d best, E. Fuller, Onondaga Valley, ... Dadd.
Best mare, A. Carley, Geddes, ... $10
2d best, W. A. Fay, Onondaga, ... 5

No. 25. Matched Horses,—16 hands.

Best pair, C. D. Miller, Peterboro, ... 15
2d best, John Holmes, Delphi, ... 10

No 26. Matched Horses,—15 hands.

Best pair, J. McKinley, Salina, ... 15
2d best, John Oliver, Sterling, ... 10

No. 27. Matched Horses—14 hands.

2d best pair, W. W. Heath, Cazenovia, ... 10

No. 28. Matched Trotting Horses for Road.

Best pair, E. M. Holmes, Cazenovia, ... 15
2d best, J. Wright, Waterloo, ... 10

No. 29. Geldings.

Best, M. Barrows, Henderson, ... 10
2d best, C. Wolcott, Trenton, ... 8
3d special premium, Amos Jackson, Syracuse, ... Youatt.
4th special premium, M. Parsons, Clifton Springs, ... Youatt.

No. 30. Single Mare.

Best, J. Davis, Van Buren Center, ... $10
2d best, H. T. Fox, Manlius, ... 8
3d best, J. S. Baker, Skaneateles, ... Trans.

No. 31. Horses, Single Trotting Horse, Mare or Gelding in Harness.

Best, Joseph Wright, Waterloo, ... $10
2d best, John S. Stevenson, Buffalo, ... 8
C. Carrol, Brooklyn, Trotting Mare, "Miller's Damsel," ..... Youatt.

No. 32. From Canada.

Best blood stallion, 3 years and upwards, P. S. Smith, Toronto, C. W., $15
Best stallion horse, all work, 3 years and upwards, E. H. Lewis, Belleville, C. W., ... 15
Best draught stallion, 3 years and upwards, Joseph Black, Guelph, Canada, ... 15
Best Gelding, E. H. Lewis, Belleville, C. W., ... 10

No. 33. Jacks and Mules.

Best jennet, E. C. Bliss, Westfield, ... 20
Best pair, James Dempsey, Canandaigua, ... 10

CLASS III.

No. 34. Fat Sheep.

Best fat sheep, long wooled, 2 years and upwards, A. & H. Bowen, Jr., Medina, ... $5
2d best, E. G. Cook, Rural Hill, ... 3
3d best, L. W. Rathbun, East Springfield, Otsego, ... Morrell's Shep.

Best long wooled, under 2 years, E. G. Cook, Rural Hill,..... $5
Best cross breed, 2 years and upwards, Stephen Leggett, Henrietta,.. 5
2d best, O. Howland, Auburn,..... 3
3d best, George Kerr, Auburn, ... Morrell's Shep.
Best cross breed, under 2 years, J. F. Converse, Woodville, Jefferson county,..... $5
2d best, O. Howland, Auburn,..... 3
3d best, George Kerr, Auburn, ... Morrell's Shep.

No. 35. Long Wooled.

Best buck, 2 years and upwards, Hungerford, Brodie & Co., Adams, Jefferson county,..... $10
2d best, Hungerford, Brodie & Co., Adams, Jefferson county, ... 8
3d best, Ezra Ringer, Lyons, Wayne, ... 5
Best buck under 2 years, E. Gazley, Clinton, Dutchess,..... 10
2d best, E. Gazley, Clinton, Dutchess,..... 8
3d best, H. S. Tryon, Fleming, Cayuga,..... 5
Best pen five ewes, two years and upwards, Hungerford, Brodie & Co., Adams,..... 10
2d best, Hungerford, Brodie & Co., Adams, ... 8
3d best, L. W. Rathbun, ... 5
Best pen three buck lambs, Hungerford, Brodie & Co., Adams,..... 5
2d best, E. Gazley, Clinton,.....Morrell's Shep.
Best pen three ewe lambs, Hungerford, Brodie & Co., Adams,..... 5
2d best, L. W. Rathbun, E. Springfield, ...Morrell's Shep.

No. 36. Middle wooled.

Best buck, two years and upwards, Samuel Thorne, Thornedale, Dutchess,..... $10
2d best, Thomas Messenger, Great Neck, L. I., ... 8
3d best, Erastus Corning, Jr., Albany,..... 5
Best buck under two years, S. Thorne,..... 10
2d best, L. Bailey, Croton Falls,..... 8
3d best, S. Thorne, Thorndale, ... 5
Best pen five ewes, two years and upwards, Thomas Messenger, Great Neck, L. I., " Hampshire Downs,"..... 10
2d best, E. Marks, Camillus,..... 8
3d best, F. F. Hyatt, Owego, Tioga, ... 5
Best pen three buck lambs, Lyman Bailey, Croton Falls, ... 5
Best pen three ewe lambs, L. Bailey, Croton Falls,..... 5
2d best, George Cross, De Witt,.....Morrell's Shep.

No. 37. Spanish Merinos.

Best buck, two years and upwards, D. Cossit, Onondaga, ... $10
2d best, two years, N. M. Dart, Harpersfield, Delaware,..... 8
3d best, S. A. Winslow, Bristol, Ontario, ... 5
Best buck under two years, E. G. Cook, Rural Hill,..... 10
2d best, N. M. Dart Harpersfield,..... 8
Best pen five ewes, two years and upwards, D. Cossit, Onondaga, ... 10

2d best, N. M. Dart, Harpersfield,..... $8
3d best, O. Howland, Auburn..... 5
Best pen five ewes under two years, D. Cossit, Onondaga,..... 10
2d best, N. M. Dart, Harpersfield, ... 8
Best pen three buck lambs, D. Cossit, Onondaga,..... 5
2d best, N. M. Dart, Harpersfield, ...Morrell's Shep.
Best pen three ewe lambs, N. M. Dart, Harpersfield,..... 5
2d best, O. Howland, Auburn,.....Morrell's Shep.
Best samples wool, five fleeces, George Brown, Oaks Corners, Ontario county,.....S. M.

No. 38.—Silesian Merinos.

Best buck, two years and upwards, Wm. Chamberlain, Red Hook, Dutchess,..... 10
2d best, Wm. Chamberlain, Hed Hook, Dutchess,..... 8
3d best, E. G. Cook, Rural Hill,..... 5
Best buck under two years, Wm. Chamberlain, Red Hook,..... 10
Best pen five ewes five years and upwards, Wm. Chamberlain, Red Hook, ... 10
Best pen five ewes under two years, Wm. Chamberlain, Red Hook, .. 10
Best pen three buck lambs, do do 5

No. 39.—French Merinos.

Best buck, two years old and upwards, J. D. Patterson, Westfield, Chautauque..... 10
2d best, two years and upward, J. D. Patterson, Westfield, Chautauque, 8
3d best, do do do 5
Best buck under two years, do do 10
2d best, do do do 8
3d best, do do do 5
Best pen of five ewes, two years and upwards, Chautauque, ... 10
2d best, do do do 8
Best pen of five ewes under two years, do 10
2d best, Wm. Chamberlain, Red Hook, ... 8
Best pen of three buck lambs, J. D. Patterson, Westfield, ... 5
2d best, do do do Morrell's Shep.
Best pen of three ewe lambs, do do $5
2d best, do do do Morrell's Shep.

No. 40.—Saxons.

Best buck, two years and upwards, Davis Cossit, Onondaga, ... $10
2d best, T. V. Maxon, Adams, Jefferson,..... 8
3d best, O. Howland, Auburn, ... 5
Best buck under two years, T. V. Maxon, Adams,..... 10
2d best, T. V. Maxon, Adams, ... 8
Best pen five ewes under two years, Davis Cossit, Onondaga, ... 10
Best pen three buck lambs, Davis Cossit, Onondaga, ... 5
Best sample of wool fleeces, Davis Cossit, Onondaga,.....S. M.

No. 41.—Cross Breed, Fine Wool.

Best buck of 2 years and upwards, S. A. Winslow, Bristol, ... $10
2d best, S. A. Winslow, Bristol,..... 8
3d best, E. G. Cook, Rural Hill, ... 5
Best buck under 2 years, S. A. Winslow, Bristol,..... 10
2d best, E. G. Cook, Rural Hill,..... 8
Best pen of 5 ewes, 2 years and upwards, W. Chamberlain, ... 10
2d best, S. A. Winslow, Bristol,..... 8
3d best, E. G. Cook, Rural Hill,..... 5
Best pen of 5 ewes under 2 years, E. G. Cook,..... 10
2d best, D. Cossit, Onondaga, ... 8
3d best, E. G. Cook, Rural Hill,..... 5
Best pen of 3 buck lambs, E. G. Cook, Rural Hill,..... 5
Best pen of 3 ewe lambs, E. G. Cook, Rural Hill,..... 5
2d best, D. Cossit, Onondaga,.....Mor. Shep.
Best samples of wool and fleece, D. Cossit, Onondaga,.....S. M.

No. 42.—Cross Breed, Coarse or Middle Wool.

Best buck, 2 years and upward, G. W. Peck, East Bethany,... .... $10
2d best, George Kerr, Auburn,..... 8
3d best, John Dack, Woodville,..... 5
Best buck under 2 years, A. Eastman, Ellisburgh..... 10
Best pen 5 ewes, 2 years and upwards, Robert Brodie, Henderson, .. 10
2d best, A. & H. Bowen, Jr., Medina,..... 8
3d best, Wood & Eastman, Woodville..... 5
Best pen 5 ewes, under 2 years, A. Eastman, Ellisburg,..... 10
2d best, R. Brodie, Henderson,..... 8
3d best, Wood & Eastman, Woodville, ... 5
Best pen 3 buck lambs, R. Brodie, Henderson,..... 5
2d best, George Peck, E. Bethany, ...Mor. Shep.
Best pen 3 ewe lambs, Wood & Eastman, Woodville,..... $5
2d best, G. W. Peck, E. Bethany,.....Mor. Shep.

No. 43.—Out of the State.

Long wooled best buck, J. Snell, Edmonston, C. W., ... $10
Best pen 5 ewes, J. Snell, Edmonston, C. W.,..... 10

No. 44.—Out of the State.

Merinos, best buck, Geo. Campbell, Westminster, Vermont, ... $10
Best pen 5 ewes, G. Campbell, Westminster, Vermont..... 10

Mr. E. Rich, Addison, and Mr. Stickney, Shoreham, Vt., pen of Merino bucks and ewes, worthy of prizes, Diploma awarded to each.

No. 45.—Swine—Large Breed.

Best boar, 1 year, S. D. Hungerford, Adams,..... $10
Best boar, 6 months, Jas. Brodie, Ellisburg, Jefferson county,..... 8
Best breeding sow 1 year old, imported, S. D. Hungerford, Adams,.. 10
2d best, A. B, Benham, McLean,..... 3

Best breeding sow, 1 year old, Jas. Brodie, Ellisburg,..... $10
2d best, S. D. Hungerford, Adams, ... 5
Best sow, 6 months, S. D. Hungerford, Adams,..... 8
2d best, 6 months, S. D. Hungerford, Adams,..... 4
2d best lot of pigs, under 10 mos., Geo. Cross, DeWitt, Onondaga,.. 4

SMALL BREED.

Best boar, 2 years old and upwards, J. J. Hopper, Onondaga Valley, 10
2d best, E. C. Bliss, Westfield,..... 3
Best boar 4 years old, Enoch Marks, Camillus,..... 10
2d best, E. G. Cooke, Rural Hill, ... 5
Best boar, 6 months and under 1 year, S. Thorne, Thorndale,..... 8
2d best, E. Marks, Camillus,..... 4
Best breeding sow 2 years old and upwards, E. C. Bliss, extra nice,. 10
2d best, J. J. Hopper, Onondaga Valley,..... 5
2d best breeding sow, 1 year old, E. Marks, Camillus, no competition, 5
Best sow 6 months and under 1 year, E. Walter, Syracuse,..... 8
2d best, E. Marks, Camillus,..... 4
Best lot pigs under 10 months, E. C. Bliss, extra, ... 8
2d best, Stephen Mercer, Onondaga Valley, ... 4
James Brodie, Ellisburg, boar and sow large breed, very fine, commended.
James Durand, Kingston, C. W., imported hogs, good breed, diploma.

No. 46.—POULTRY.

Best lot white Dorkings, E. S. Ralph, Buffalo,..... 3
2d do W. R. Hills, Albany,..... 2
Best gray or speckled Dorkings, D. S. Hefron, Utica,..... 3
2d do E. A. Wendell, Albany,..... 2
Best lot black Spanish, W. R. Hills, Albany,..... 3
2d do D. S. Hefron, Utica,..... 2
Best lot black Polands, E. A. Wendell, Albany,..... 3
2d do W. R. Hills, Albany,..... 2
Best lot golden Polands, E. S. Ralph, Buffalo,..... 3
2d do W. R. Hills, Albany,..... 2
Best lost silver Polands, W. R. Hills, Albany,..... 3
2d do E. S. Ralph, Buffalo,..... 2
Best lot Jersey blues, C. Rowe, Onondaga Valley,..... 3
Best lot Bolton grays, J. H. Clapham, Albany, ... 3
2d do W. R. Hills, Albany,..... 2
Best lot game, Earl Derby, D. S. Hefron, Utica,..... 3
2d do W. R. Hills, Albany,..... 2
Best lot game, English pheasant, E. A. Wendell, Albany,..... 3
2d do E. S. Ralph, Buffalo,..... 2
Best lot game Sumatra, W. H. Gifford, Syracuse,..... 3
2d do E. S. Ralph, Buffalo,..... 2
Best lot game Mexican, E. S. Ralph, Buffalo,..... 3

Best lot game Irish, W. S. Barton, Oneida, ... $3
2d do W. R. Hills, Albany, ... 2
Best lot game Chinese, E. S. Ralph, Buffalo, ... 3
Best lot buff or red shanghai, E. A. Wendell, Albany, ... 3
2d do W. R. Hills, Albany, ... 2
Best lot white shanghai, W. R. Hills, Albany, ... 3
2d do A. P. Howe, Collamer, ... 2
Best lot gray shanghai, J. Dack, Woodville, ... 3
2d do E. G. Cook, Rural Hill, ... 2
Best lot black shanghai, E. A. Wendell, Albany, ... 3
Best lot Dominique shanghai, E. S. Ralph, Buffalo, ... 3
2d do D. S. Hefron, Utica, ... 2
Best lot gold lace bantams, E. S. Ralph, Buffalo, ... 3
2d do E. S. Ralph, Buffalo, ... 2
Best lot Java, E. S. Ralph, Buffalo, ... 3
Best lot African, W. R. Hills, Albany, ... 3
2d do E. A. Wendell, Albany, ... 2
Best lot English bantams, E. A. Wendell, Albany, ... 3
Best lot Nankin bantams, E. S. Ralph, Buffalo, ... 3
Best lot native fowls, W. R. Hills, Albany, ... 3

TURKIES.

Best pair turkies, W. R. Hills, Albany, ... 3
2d do O. Howland, Auburn, ... 2
Best pair wild turkies, J. D. Alvord, Syracuse, ... 3
2d do O. Howland, Auburn, ... 2

DUCKS.

Pair Rowen ducks, very fine, D. S. Hefron, ... 3
Best pair Muscovy, G. W. Crosby, Onondaga, ... 3
2d do O. Howland, ... 2
Best pair Aylesbury, D. S. Hefron, Utica, ... 3
2d do N. Barnes, Kirkland, ... 2
Best pair black Cayuga, J. D. Alvord, Syracuse, ... 3
2d do E. A. Wendell, Albany, ... 2
Best pair top-knots, N. Barnes, Kirkland, ... 3
2d do E. A. Wendell, Albany, ... 2
Best pair common top-knots, N. Barnes, Kirkland, ... 3
2d do E. S. Rulph, Buffalo, ... 2

GEESE.

Best pair common, E. A. Wendell, Albany, ... 3
2d do O. A. Howland, Auburn, ... 2
Best pair Bremen, E. A. Wendell, Albany, ... 3
2d do J. Read, Marcellus, ... 2
Best pair white China, A. P. Howe, Collamer, ... 3
2d do A. P. Howe, Collamer, ... 2
Best pair African, A. P. Howe, Collamer, ... 3

2d best pair African, O. Howland, Auburn,..... $2
Best pair wild, J. H. Hibbard, Onondaga Valley,..... 3

GUINEA FOWLS.

Best lot, N. Barnes, Kirkland,..... 3
2d do E. S. Ralph, Buffalo,..... 2

PEA FOWLS.

Best lot, C. A. Congdon, Salina,..... 3
2d do W. R. Hills, Albany,..... 2

PIGEONS.

Best variety, D. S. Hefron, Utica,..... 3
Best lot poultry owned by exhibitor, E. A. Wendell, Albany,..... 5
2d best, E. S. Ralph, Buffalo,..... 2

RABBITS.

Best pair long-eared, E. S. Ralph, Buffalo,..... 3
2d best, J. H. Clapham, Albany,..... 2
Best pair common, E. A. Wendell, Albany,..... 3
2d best, J. H. Clapham, Albany,..... 2

Discretionary.

Malacca game, E. S. Ralph, Buffalo,.....Dip.
E. A. Dappe, Auburn, fine lot English coach dogs,.....Dip. and S. M.

CLASS 4.

No. 47.—Plowing Match.

1st premium, Charles Worker, Onondaga,..... $20
2d do A. Fay, Jr., Geddes,..... 15
3d do A. Lathrop, Geddes,..... 10
4th do D. B. Westfall, Lyons,..... 5
5th do Geo. P. Thomas, Westmoreland,.....Trans.

Boys under eighteen years old.

1st premium, S. D. French, Richfield Spa, plow patent convex mold-board and iron frame plow,..... $20
2d premium, J. A. Nottingham, Syracuse,..... 15
3d do Geo. Brydon, Kirkland,..... 10
4th do Henry Stevens, Jr., Geddes,..... 5

Volume Transactions recommended to the following:

John Hayden, plowman,..... Trans.
Wm Ballard, spader,..... do
C. W. Eells, plowman,..... do
Joseph Burden, plowman, Onondaga,..... do
George Collins, Watertown,..... do
S. Campbell, N. Y. Mills,..... do
Peter Auld, Utica,..... do
G. W. Keeler, Central Square,..... do
John Christopher, Manlius, plowman,..... do
Thomas Wilcox, Fulton, plowman,..... do

J. B. Noyes, Liverpool,..... Trans.
W. E. Pomeroy, Syracuse,..... do
Rosson Anderson, Onondaga Valley, plowman,..... do
R. M. Hermance, Utica, plowman,..... do
Wm. Friend, Syracuse, spader,..... do

No. 48.—Spading.

1st premium, Edward Hartneys, York Mills,..... $8
2d do Peter Melville, York Mills,..... 5
3d do Wm. Keeler, Syracuse,..... 3

No. 49.—Farm Implements.

Best farm wagon, T. D. Morgan, Deerfield, Oneida,..... 5
2d best do do do do 3
Best harrow, J. W. Barret, Fulton, Buckeye Rotary,..... 5
2d best, J. E. Morgan, Deerfield, Oneida,..... 3
Best corn cultivator, J. E. Morgan,..... 5
2d best corn cultivator, Holmes, Stringer & Co., Munsville,..... 3
Best fanning and assorting machine, "R. Nutting's patent," Wallace Warren, Utica,..... 5
2d best fanning mill, W. Reynolds, Lyons,..... 3
Best corn stalk cutter, J. C. Rich, Penfield,..... 5
2d best corn stalk cutter, S. P. Smith, Troy,..... 3
Best hay and straw cutter, J. E. Dutton & Co., Fulton,..... 5
2d best hay and straw cutter, D. Babcock, Dryden,..... 3
Best corn and cob crusher by horse power, Emery Brothers, Albany,. 5
2d best corn and cob crusher by horse power, J. M. Allen, Frederick-town, Ohio, "Hall's Young America,"..... 3
Best clover machine, J. C. Birdsall, West Henrietta,..... 5
2d best clover machine, R. H. Pease, Albany,..... 3
Best horse rake, A. A. Sweet, Watervale, Onondaga,..... 4
2d best horse rake, Houston & King, Middletown,..... 2
Best ox yoke, W. E. Pomeroy & Co., Syracuse,..... 2
Best roller for general use, with grass seed and plaster sower attached, C. Bartholomew & Son, Etna,..... 5
2d best roller for general use, J. M. & S. W. Baldwin, Baldwinsville, 3

Discretionary.

Clover thrasher and bolter, F. & D. Bramer, Fabius,..... Dip.
Improved attaching body to bob-sleigh, W. St. John, Lima,..... S. S. M.
Fanning mill, Darrow & Brooks, Otisco,..... Trans.
Clover thrasher and separator, Westerhouse & Co., Schenectady,.. Trans.
First premium on Empire corn husker, G. Bellows, Seneca Falls,... Dip.
2d do corn husker, E. D. Hallock, Rochester,..... $2
3d do corn husker, "Little Giant," Seymour & Martin, S. Falls, Trans.
Special premium, Diploma, to C. N. Lewis, Seneca Falls, for Empire corn husker.

Special Committee.

Climax grain fan, a very superior machine, A. H. Brainard & Son, Rome,..... Dip.
Corn plow and cultivator, J. M. Burke, Dansville,..... Trans.

No. 50. Farm Implements.

Best single harness, Stuber & Cratsenberg, Turin,..... $5
2d do L. B. Gates, Barre Center,..... 2
Best churn, W. Burnham Cortlandville,..... 5
2d do E. Bromfield, Cleveland, Ohio,..... 2
Best cheese press, A. B. Cravath, Hermitage; J. Hibbard's patent,. 5
2d do Chas. Taylor, Little Falls,..... 2
Best grain cradle, Charles Clow, Port Byron,..... 3
2d do H. Robinson & Son, Lafayette,..... 2
Best 12 hand rakes, J. Boley, Baldwinsville,..... 3
Best 6 grass scythes, do 3
Best scythe snathes and scythe, do 3
Best potatoe digger, J. E. Hardenburg, Fultonville,..... 3
2d do M. Little, Clyde,..... 2
Best lot grain measures, B. G. Bentley, Clay,..... 3
Best barley fork, D. P. Widrig, Baldwinsville,..... 3
2d do Charles Clow, Port Byron,..... 2
Best spokes and bent carriage work, Brigham Field & Co., Syracuse, Trans.
Best horse hay fork, C. E. Gladding, Troy, Pa.,..... $5
2d do Emery Brothers, Albany,..... 2
Best cheese vat and heater, S. S. Dorman, Kingsman, Ohio,..... 5
Best hoe handles, L. Fortune, Le Rayville,..... 1
Best fork handles, do 1
Best case of dairy knives, D. G. Young, Cedarville,..... 2
Churning, washing and cutting machines, Moses Swan, Potter Hill,. 2
Best shepherd's crook, James Geddes, Fairmount,.....S. M.
One dozen horse shoes, George Phillips, Syracuse,..... Trans.
Box axe helves, L. Fortune, Le Rayville,..... Trans.
Frost's patent scythe snath & patent fastener, A. McKinstry, Syracuse,. Dip.
Common gentlemen's saddle, B. Suits, Chittenango,..... do
Fancy Mexican saddle, do ..... do

No. 51. Farm Implements.

Best portable saw mill, for wood, fences and farm use, E. D. Hallock, Rochester,..... $8
2d do R. H. Pease, Albany,..... 6
Best corn sheller, horse power, Emery Brothers, Albany,..... Dip.
Best corn sheller, hand power, C. C. Bellows, Syracuse,..... $6
2d do G. W. Doxtater, Rochester,..... 4
Corn sheller, Ray Green, Caughnawaga, Pa ,.....S. M.
Corn sheller, "Young America," Leavenworth & Mason, Rochester, do
Best vegetable cutter, Roswell Wilcox, Saxton River, Vermont, ... $6

Best portable grist mill, A. Orvis, Sus. Bridge, ... $8
2d do Emery Brothers, Albany, ... 6
Best hand cross cut saw mill, Potter & Kellogg, Carthage, ... Dip.
2d do Hall & Heath, Adams Center, ... Trans.
Cider mill and corn sheller, Thomas Wall, Cincinnati, O., ... $5
Best cider and wine mill, Emery Brothers, Albany, ... 3
Best dog power churning machine, Emery Brothers, Albany, ... 5
Best pump for farm use, G. W. Hall, La Fayette, ... 5
Best horse hoe for cleaning drilled grain crops, Sayer & Remington, Utica, ... 8
Best and most numerous collection of agricultural implements, Emery Brothers, Albany, ... 20
2d best, Sayer & Remington, Utica, ... 15
Best and most numerous collection of agricultural and gardening tools and implements, manufactured in the State of New York, by or under the supervision of the exhibitor, materials, workmanship, utility, durability, and prices to be considered in both cases, Emery Brothers, Albany, ... 20
2d best, R. H. Pease, Albany, ... 15

No. 52. Mowers and Reapers.

Best combined mower and reaper, R. L. Howard, Buffalo, "Ketchum's," ..... S. M.
2d best, Walter A. Wood, Hoosick Falls, ... S. S. M.

Reapers.

Best, D. M. Osborn, Auburn, ... S. M.
2d best, J. & G. Lord & Co., Watertown, mower, reaper and raker, combined, ... S. S. M.
Best self-raking reaper, J. V. Wemple, Fonda, ... Dip.

Mowers.

Best, John P. Adriance, Buckeye, N. Y., ... S. M.
2d best, E. E. Lewis, Geneva, ... S. S. M.

Mower—1 Horse Power.

Best one horse mower, John Gore, Fredonia, ... S. M.

Horse Powers.

Best railway horse power, R. H. Pease, Albany, ... S. M.
2d best, Emery's horse power, Emery Brothers, Albany, ... S. S. M.
2d best Lever 10 horse power, C. Perigo, Groton, N. Y., ... S. M.

Thrashers, Cleaners, Separators.

Best thrasher and winnower, G. Westerhouse & Co., Schenectady, .. S. M.
2d best 2 horse power, D. L. Halsey, Victory, Cayuga county, .. S. S. M.

Tile Machine.

Best drain tile, hollow brick and roof tile machine, F. M. Mattice, Buffalo, ... S. M.
Samples drain tile, F. Danforth, Auburn, ... $5
Boring and mortising machine, C. S. Totman, Syracuse, ... S. S. M.

Machine for cutting bolts and nuts, A. C. Powell, Syracuse,..... Dip.
Grain separator, T. S. Angel, Watertown,..... Dip.
Grain binder, A. Sherwood, Auburn,..... Dip.
Self-adjusting wagon brake, A. W. Chase, Cohocton,..... Dip.
Garden Engine, F. G. Wynkoop, Corning, ... Dip.
Lot bench hooks, W. H. Putnam, Nashua, N. H.,..... Dip.
Patent excavator, A. W. Cady, Sullivan,..... Dip.
Spoke planing machine, L. Perigo, Geneva,..... Dip.
Portable fence, Carhart Brothers, Syracuse, ... Dip.
Capstan gate, C. Winnegar, Union Springs, ... Dip.
Boring and mortising machine, spoke tenoning, axle indicator, G. N. Stearns, Syracuse,..... Dip.
Farm gate, Lyman Toby, Naples,..... Dip.
Pump augurs, John Miller, Dansville, ... Dip.
Covert's new permulation bank lock, M. Briggs, Rochester,..... Dip.
Grain drill, Seymour & Lewis, Victor,..... Dip. and S. M.
Horse chain power and cut saw fixtures, D. L. Halsey, Victory, ... Dip.
Excelsior gate double hinges, C. E. Burnham, Binghamton,..... Dip.
Smut machine, J. N. Lester, Oswego, ... Dip.
Burke's patent skein for axle arms, M. L. Davis, Dansville,..... Dip.
Delano's improved method of feeding fuel to furnaces from the bottom H. Delano, Syracuse,... ..... S. M.
Portable steam saw mill (guide plate), C. B. Hutchinson, Auburn,.. Dip.
Spoke sett and tennoning machine, A. D. Stowell, Fulton, N. Y., ... Dip.
Shingle machine, J. W. Porter, Syracuse,..... S. M.
Probang for relieving choking cattle, Thomas Messenger, Great Neck, L. I., ... Dip.

No. 52, A.—Implements and Machinery.

Best plow, W. Warren, Penn Yan, Warren's patent, ... S. M.
Best cast steel plow, J. & G. Lord & Co., Watertown,..... S. M.
Best hay and cattle weighing scales, Duryea & Forsyth, manufacturing company, Rochester, ... S. M.
Best moveable steam engine for farm use, Cobb & Herrick, Syracuse, ... Plate, $20
Best stationary engine, R. Griffin & Son, Syracuse, ... S. M.
Best Dynamometer, Emery & Bros., Albany,..... S. M.
Best hay press, E. Wilson, Albany,..... S. M.
Best machine for expressing juice from sugar cane, Emery & Bros., Albany,..... S. M.
Garden seed sower, L. M. Stearns, Syracuse,..... S. M.
Circular saw machine, J. Gilman, Nashua, N. H.,..... Dip.
Cement pipe for drains, M. R. Pierce, Syracuse, ... Dip.
Salt pan, W. S. Worthington, Newtown, L. I.,..... S. M.
Platform scales, Duryea & Forsyth, Manufacturing company, Rochester,..... Dip.
Specimens of hollow brick, F. Danforth, Auburn,..... Dip.

Double acting coal grate, D. G. Stafford, Syracuse,..... Dip.
Pointer plow, Anson Titus, Phelps, ... S. M.
Rolling machine for leather, R. Downs, Jr., Mexico, ... Dip.
Specimens hand forging and set mill dogs, Seymour & Adams, Rome, S. M.
Bank lock and safe, Duryea & Forsyth, Man. Co., Rochester, ... S. M.
Improved shovel plows, Paul Dennis, Bemus Heights,..... S. M.
Mincing machine, A. H. Hayes, Durham, ... Dip.
Ditch digger, R. C. Pratt, Canandaigua,..... S. M.
2 cases planing machine and mowing and reaping machine knives, Whitman & Miles, West Fitchburg, Mass., ... Dip.
Improved spring bottoms for chairs and beds, G. W. Griswold, Carbondale, Pa.,..... Dip.
Boot and shoe stretcher, G. W. Griswold, Carbondale, Pa., ... Dip.
Metalic heel brace for boots, G. W. Griswold, Carbondale, Pa.,..... Dip.
Blacksmith's drill, S. B. Pierce, Homer,..... Dip.
L. J. Worden's patent hub and axle coupling, Webster Smith, Utica, Dip.
Improved removable window sash, R. H. Kirk's patent, W. Smith, Utica, ... Trans.
Felloe machine, T. Sherman, Mohawk,..... Dip.
Steam boiler alarm, A. Miller, Cleveland, Ohio,..... Dip. and S. M.
Self-adjusting railroad switch, D. G. Stafford, Syracuse,..... Dip.
Double acting coal grate, D. G. Stafford, Syracuse, ... Trans.
Optical lathe, W. H. Craig, Syracuse,..... S. M. & Trans.
Doty's fruit gatherer, Wm. Doty, S. Hartford,..... S. S. M.
Improvement on mowing machine, S. E. & M. P. Jackson, Boonville, Dip.
A. Miller's combined corn and bean planter, Whiteside & Burnett, Brockport, ... Dip.
Tile Drain, C. & W. J. McCammon, Albany,..... S. M.
Portable steam engine, for farm use, with cooking apparatus attached, A. N. & E. D. Wood, Utica,..... S. M.
Six ton hay scale, with newly invented principles, F. E. & J. Howe, Jr., Brandon, Vt.,..... S. M.

Hay Scales.

A special committee appointed to test hay and cattle scales, reported that they tested the scales entered by F. E. & John Howe, of Brandon, Vt., patented by Strong & Ross. A car was loaded with 2,692 lbs of pig iron, and moved from the center to the different corners of the platform, without any perceptible variation of the balance beam. Scaled 50 lb. weights were then placed upon the platform, the scales indicating with remarkable exactness the weights thus added. The capacity of these scales was six tons, and the price $150. There are some new principles claimed to be applied to this scale, but of their absolute utility we are not prepared to speak.

A. H. Brainard,
J. A. Bunce.

CLASS 5.

No. 53.—Grain and Seed.

Best sample white winter wheat, grown the present year, 1 bbl., W. P. Ottley, Phelps,..... $5
Best sample red winter wheat, G. N. Rose, Syracuse, ... 5
2d best, James C. Garret, Salina,..... 3
Best sample red spring wheat, 1 bbl., do, S. W. Abbot, Clinton,.... 5
2d best, A. H. Clapp, Manlius,..... 3
Best sample rye, 1 bbl., B. S. Carpenter, Elmira,..... 5
Best sample oats, 1 bbl., C. W. Eells, Westmoreland, ... 5
2d best, H. M. Gaylord, Fairmount,..... 3
Best sample barley, 1 bbl, O. Howland, Auburn, ... 5
2d best, W. P. Ottley, Phelps,..... 3
Best sample Indian corn, shelled, 1 bbl, W. P. Ottley, Phelps, ... 5
2d best, B. S. Carpenter, Elmira,..... 3
Best sample buckwheat, 1 bush., L. L. French, Richfield Spa, ... 3
2d best, P. B. Palmer, Otisco, ... 2
Best sample millet, half bush., H. M. Gaylord, Fairmount, ... 3
2d best, Henry Wier, Pittstown,..... 2
Best sample Chinese sugar cane seed, C. F. Crossman, Rochester, ... 3
2d best, Chester Clark, Marcellus, ... 2
Best sample timothy seed, 1 bushel, J. B. Garret Salina,..... 3
2d best, O. Howland, Auburn,..... 2
Best twelve ears yellow seed corn, A. B. King, De Witt, ... 3
2d best, N. Kellogg, Salina, ... 2
Best twelve ears white seed corn, P. Pendleton, Norwich, ... 3
2d best, A. B. King, Dewitt, ... 2
Best 12 ears sweet corn, J. Watson, Clyde, ... 3
2d best, Wm. Day, Syracuse,..... 2
Best sample white beans, 1 bbl., S. W. Abbott, Clinton,..... 5
2d best, J. C. Garret, Salina,..... 3
Best sample peas, 1 bbl, J. P. Wiley, Onondaga,..... 5
Best sample flax seed, 1 bush., H. Wier, Pittstown,..... 3
2d best, J. P. Wier, Pittstown,..... 2
Best sample hops, 25 lbs., J. H. Dunbar, Hubbardsville, ... 5
2d best, M. Keith, Oran, ... 3
Tress seed corn, sixty feet long, J. Barber, Rome, ...S. M.
Ohio Dent corn, Joseph Wright, Waterloo, ...Diploma.

No. 54.—Vegetables.

Twelve best stalks of celery, grown by owner or cultivator of farm, C. F. Crossman, Rochester,..... $3
2d best, Wm. Day, Syracuse,..... 2
Six best heads of cauliflower, F. Herbst, Syracuse,..... 3
2d best, N. Culver, Newark, ... 2
Twelve best table turnips, J. J. Hopper, Onondaga Valley,..... 3

2d best, C. F. Crossman, Rochester,..... $2
Twelve best carrots, N. Culver, Newark,..... 3
2d best, C. F. Crossman, Rochester,..... 2
Twelve best beets, N. Culver, Newark,..... 3
2d best, Wm. Day, Syracuse,..... 2
Twelve best parsneps, H. Murray, Oswego,..... 3
2d best, N. Culver, Newark,..... 2
Twelve best onions, Joel B. Noyes, Liverpool,..... 3
2d best, W. E. Bainbridge, Salina,..... 2
Six best heads cabbage, J. J. Hopper, Onondaga Valley,..... 3
2d best, P. H. Hanlan, Syracuse,..... 2
Twelve best tomatoes, J. Barber, Homer,..... 3
2d best, Wm. Day, Syracuse,..... 2
Two best purple egg plants, C. F. Crossman, Rochester,..... 3
Twelve best sweet potatoes, Thomas Messenger, Great Neck, Queens county,..... 3
2d best, A. B. Thacker, Hastings Center,..... 2
Best half peck Lima beans, N. Culver, Newark,..... 3
2d best, Mrs. Allen Munroe, Syracuse,..... 2
Windsor beans, B. S. Carpenter,..... S. M.
Best three heads lettuce, Mrs. Allen Munroe, Syracuse,..... 3
Best twelve summer radishes, N. Culver, Newark,..... 3
2d best, P. H. Hanlan, Syracuse,..... 2
Best brocoli or German beans, Mrs. J. T. Van Namee, Pittstown,..... 3
Best bunch double parsley, Mrs. Allen Munroe, Syracuse,..... 3
2d best, C. F. Crossman, Rochester,..... 2
Three best garden squashes, N. Culver, Newark,..... 3
2d best, Elihu Walter, Syracuse,..... 2
Three best large squashes, Elihu Walter, Syracuse,..... 3
2d best, John B. Garrett, Syracuse,..... 2
Best field pumpkin, J. B. Noyes, Liverpool,..... 3
2d best, Thomas H. Wands, Collamer,..... 2
Best half peck of table potatoes, M. Ormsby, Onondaga,..... 3
2d best, J. J. Hopper, Onondaga Valley,..... 2
Best and greatest variety of vegetables, presented in best condition, raised by exhibitor, J. Barber, Homer,..... 10
2d best, C. F. Crossman, Rochester,..... 5
Prolific onion, J. Barber, Homer,..... Trans.
Mammoth pumpkins, good display, B. C. Butler, Luzerne,..... do
Citrons, splendid display, W. Day, Syracuse,..... do
Eight mammoth pumpkins, raised on one vine, George Raynor, Syracuse,..... do
Six stalks seedling Victoria rhubarb, extra, Henry Wier, Pittstown, do
"Vegetable King," very attractive, Mrs. John Plowright, Syracuse, S. M.

No. 55. Flour, &c.

Best barrel flour, Ira D. Everson, Utica,..... S. M.

Best sample starch from corn, Glen Cove Starch Manufacturing Co., L. I., ... S. S. M.
Best bbl crackers, I. A. Thurber & Son., Syracuse, ... S. S. M.
Best sample domestic wheat bread, F. Danforth, Auburn, ... S. S. M.
Best sample dried apples, not less than ½ bushel, B. S. Carpenter, Elmira, ... Buist's Gardener.
Best brown bread, Mrs. Mary A. Burk, Phœnix, ... S. S. M.
Jar melon preserves, Mrs. Geo. Reed, Camden, ... Dip.
Maizena, made from white corn for culinary use, and taking the place of Farina, to some extent, a very superior article, Glen Cove Starch Manufacturing Co., ... Dip.

No. 56. Butter.

Best lot (quality and quantity considered,) from 5 cows, 30 days, Mrs. Mary E. Woodford, West Onondaga, ... $20
Best 25 lbs. made in June, A. P. Sigourney, Watertown, ... 15
2d best, E. C. Thayer, Otterville, Orange county, ... 10
3d best, John S. Shuttuck, Norwich, ... 5
Best 50 lbs., made any time, E. Baldwin, Turin, ... 15
2d best, D. T. Weed, Newburgh, ... 10
3d best, A. E. Kingsbury, Homer, ... 5
4th best, Edwin Woolworth, Turin, ... Trans.
Best bbl. dairy salt, N. S. Gere, Geddes, ... Dip.
Best table salt, Thos. Spencer, Syracuse, ... Dip.
Rock salt, A. B. King, De Witt, ... Dip.

GIRLS UNDER 21 YEARS OF AGE.

Best lot butter, not less than 10 lbs., Miss Amanda K. Baldwin, Turin, ... S. Cup.
2d best, Miss Eliza Bannister, Phelps, ... Pair butter knives.
3d best, Miss Mary E. French, Richfield Spa, ... Set tea spoons.
4th best, Miss Rhoda Van Wagoner, Syracuse, ... S. S. M.
Butter kegs, very neat, John S. Shattuck, Norwich, ... Trans.

No. 57. Cheese.

Best 100 lbs. cheese, 1 year old and over, Clift Eames, Rutland, Jefferson county, ... $20
Best 100 lbs., less than one year old, O. Hill, Fabius, ... 20
2d best, C. Eames, Rutland, ... 15
3d best, E. Pitcher, Martinsburgh, ... 10
4th best, F. Conable, Cortlandville, ... 5
5th best, D. Cronk, Sandy Creek, ... Trans.
1 box of pine apple cheese, P. Pendleton, Norwich, ... $10

No. 58. Sugar.

Best 25 lbs. maple sugar, Martin Luce, Virgil, Cortland county, ... 5
2d best, S. B. Woolworth, Copenhagen, Lewis county, ... 3

HONEY.

Best 25 lbs. honey, George W. Haight, Homer, ... 5
2d best, Wm. Wentworth, Lafayette, ... 3

3d best, Curtiss Coe, Springport,..... Trans.
Best sample maple syrup, S. B. Woolworth, Copenhagen, Lewis county,..... Dip.
2d best, Thos. Danforth, Lafayette,..... $2
3d best, D. Cole, Cedarville,..... Trans.

Discretionary.

Model bee hive, George Calvert, Upperville, Va.,..... Dip.
2d premium, C. W. Moseley, Onondaga,..... S. S. M.
3d premium, M. Quinby, St. Johnsville, ... Trans.
Best yield of honey, George Calvert, Uppersville, Va., ... Dip.

CLASS VI.

No. 59. Woolen Goods.

Best pair woolen blankets, Mrs. O. Howland, Auburn, ... $8
2d do Elizabeth Albright, Dryden, ... 6
3d do Mrs. Henry Weir, Pittstown,..... 4
4th do Mrs. Horace Clark, Skaneateles, ... Trans.
Best 10 yards woolen cloth, Mrs. Amos Clark, Marcellus,..... $8
2d do Mrs. D. Conger, Wolcott,..... 6
3d do Mrs. S. W. Abbott, Clinton, ... 4
4th do Mrs. O. Howland, Auburn, ... Trans.
Best 10 yards woolen flannel, Mrs. Maria Chamberlain, Watervale,.. $8
2d do Mrs. J. B. Noyes, Liverpool,..... 6
3d do Mrs. Achsah Cole, Cedarville,..... 4
4th do Mrs. S. W. Abbott, Clinton, ... Trans.
Best 10 yards woolen carpet, Mrs. D. Conger, Wolcott,..... $8
2d do Mrs. D. Conger, Wolcott, ... 6
3d do Miss Jane Welling, Pittstown, ... 4
Best hearth rugg, Miss Jane Welling, Pittstown,..... 4
2d do Miss A. Carr, Upperville, Va., ... 3
Best rag carpet, Mrs. B. S. Carpenter, Elmira,..... 6
2d do Mrs. F. Dodge, Syracuse,..... 4
3d do A. Benson, Owasco, ... 2
4th do Miss Jane Welling, Pittstown, ... Trans.

No. 60.

Best double carpet coverlet, Mrs. Geo. F. Williams, Wolcott, ... $6
2d do Mrs. Daniel Conger, Wolcott, ... 4
3d do Mrs. Geo. F. Williams, do 2
4th do Mrs. Daniel Conger, ... Trans.
Best knit bed spread, Mrs. Clarinda Macy, Watervale, ... $3
2d do Mrs. Wm. Wentworth, La Fayette, ... 2
3d do Mrs. Louisa Vandervoort, Geddes, ... 1
Best pair woolen socks for gentlemen, by girls under 12 years of age, Miss Catharine McKnight, Syracuse, ... 2
2d do Miss Clark, Skaneateles, ... 1
Best stocking yarn, Mrs. Amos Clark, Skaneateles,..... 2

Best pair woolen knit stockings, Mrs. E. Boardman, Rochester,..... $2
2d do Mrs. Chester Clark, Skaneateles, ... 1
Best pair woolen fringe mittens, Mrs. H. Clark, Skaneateles, ... 2
2d do Mrs. J. B. Noyes, Liverpool, ... 1
Best woolen gloves, Mrs. J. B. Noyes, Liverpool, ... 2

No. 61.

Best 10 yards linen, Mrs. Henry Weir, Pittstown,..... 8
2d do Miss Jane Welling, Pittstown, ... 6
3d do Mrs. Amos Clark, Skaneateles,..... 4
A discretionary premium to Rhoda Hopkins, of Pompey, for a very nice piece of linen, ... 2
Best 10 yards linen diaper, Mrs. J. T. Van Namee, Pittstown, ... 8
2d do Mrs. Amos Clark, Skaneateles,..... 6
3d do Mrs. Henry Weir, Pittstown,..... 4
4th do Mrs. S. W. Abbott, Clinton, ... Trans.
Best 10 yards tow cloth, Miss Jane Welling, Pittstown, ... $4
2d do Mrs. J. T. Van Namee, Pittstown,..... 2
Best pair cotton knit stockings, Mrs. B. S. Carpenter, Elmira,..... 2
2d do Mrs. E. Sheldon, Sennett, ... 1
Best pair linen stockings, Miss C. McKnight, Syracuse, ... 2
2d do Mrs. Chester Clark, Skaneateles, ... 1
Best pound linen thread, Mrs. H. Weir, Pittstown, ... 2
2d do Mrs. Amos Clark, Skaneateles,..... 1
Best sample water rotted flax, in the straw, scutched, Mrs. H. Weir, Pittstown, ...S. M.
Best linen for gentlemen, Miss Mary E. Bannister, Phelps, ... $5
2d do Mrs. E. P. Gaylord, Fairmount,..... 3
Best 10 yds linen kersey, Miss J. Welling, Pittstown, ... 5
2d best, Mrs. H. Weir, Pittstown, ... 3
3d best, Mrs. Amos Clark, Skaneateles,.....Trans.

No. 62.—Domestic Manufactures.

Best Brussels carpeting, Thos. Kimber, Syracuse,.....Dip.

No. 63.—Needle Work.

Best silk embroidery, Mrs. George Reed, Camden, ... $3
Best shawl embroidery, Mrs. M. F. Gordon, Oswego, ... 3
2d best, crochet, Mrs. A. Roggins, Oak Grove, ... 2
3d best, crochet, Mrs. George Webb, Watertown,..... 1
Best cape embroidery, Mrs. Geo. Reed, Camden, ... 3
2d best, Mrs. Sophia Wood, Syracuse,..... 2
3d best, Mrs. W. P. Ottley, Phelps,..... 1
Best scarf and bag, Mrs. Mary Kemp, Syracuse,..... 3
2d best, Miss C. A. Pattison, Onondaga Valley,..... 2
Best toilet cushion, Mrs. A. G. Wilcox, Syracuse, ... 3
Best Turkish cushion, Mrs. D. McCarthy, Syracuse, ... 3

2d best, Mrs. Wesley Hickox, Syracuse, ... $2
3d best, Miss Gertrude Fryer, Syracuse, ... 1
Gentleman's dressing gown, Mrs. Mary Kemp, Syracuse, ... 3
3d best, Mrs. Geo. Reed, Camden, ... 1
Best specimen worsted embroidery, Miss Mary E. Bannister, Phelps, 3
2d best, Mrs. Mary Kemp, Syracuse, ... 2
3d best, Mrs. Wm. Owens. Onondega Valley, ... 1
Best chair cushion and back, Mrs. D. McCarthy, Syracuse, ... 3
2d best, Mrs. C. D. Snell, Mexico, ... 2
3d best, Mrs. S. L. Howard, Syracuse, ... 1
Best ottoman cover, Mrs. Richard Herriman, Syracuse, ... 3
2d best, Mrs. L. B. Lord, Phelps, ... 2
3d best, Mrs. W. B. Van Waggoner, Syracuse, ... 1
Best embroidered spread, Miss Kate Yanney, Johnstown, ... 3
2d best, Mrs. P. Smith, 57 years old, Syracuse, ... 2
Best specimen of papier mache, Mrs. E. T. Crocker, Syracuse, ... 3
Best silk bonnets, Miss Elizabeth Wells, Syracuse, ... 3
2d best, Mrs. Geo. Reed, Camden, ... 2
3d best, Mrs. Marietta Jenks, Gowanda, ... 1
Best straw bonnets, Miss H. M. & E. Shaw, Berkshire, ... 3
Best ornamental shell work, Mrs. H. L. Emery, Albany, ... 3
2d best, Mrs. E. T. Crocker, Syracuse, ... 2
3d best, Mrs. S. L. Howard, Syracuse, ... 1
Best specimen of wax flowers, Mrs. Wesley Hickox, Syracuse, ... 3
2d best, Mrs. N. Eaton, Syracuse, ... 2
3d best, Mrs. E. T. Crocker, Syracuse, ... 1
Best pencil drawing, Miss E. D. Turrill, Oswego, ... 3
2d best, Miss Lizzie M. Kinne, De Witt, ... 2
3d best, Mrs. E. C. Dodge, Onondaga, ... 1
Best crayon painting, Mrs. E. T. Crocker, Syracuse, ... 3
2d best, Mrs. E. C. Dodge, Onondaga, ... 2
3d best, Mrs. Henrietta McChesney, Salina, ... 1
Best oil painting, (figures,) Miss Mary Dickinson, Syracuse, ... 5
2d best, Miss E. D. Turrill, Oswego, ... 3
3d best, Miss E. P. Norton, Syracuse, ... 2
Best oil painting, (landscape,) Mrs. J. Hall, Syracuse, ... 5
2d best, Miss H. R. Ackerman, Three Mile Bay, ... 3
3d best, Miss C. A. Pattison, Onondaga Valley, ... 2
Best white bed quilt, Mrs. O. Benjamin, Canandaigua, ... 3
2d best, Mrs. Edmund Baldwin, Turin, ... 2
3d best, Mrs. J. F. Clark, Onondaga Valley, ... 1
Best transferred bed quilt, Mrs. G. F. Williams, Wolcott, ... 3
2d best, Mrs. C. Yeomans, Euclid, ... 2
3d best, Mrs. Margaret Morey, 70 years old, Syracuse, ... 1
Best silk patch work quilt, Mrs. Frances Beman, Knowlesville, ... 3
2d best, Clara Stowell, Syracuse, ... 2

3d best, Mrs. M. A. Burk, Phœnix, ... $1
Best patched work calico quilt, by girls under 12 yrs, Miss Laura E. Terry, Geddes, 4 years old,..... 3
2d best, Miss M. E. Carpenter, Elmira, 7 years old, ... 2
2d best, Grace E. Terry, Geddes, 5 years old,..... 1

Discretionary.

Mrs. M. C. Remington, Sennett, specimen silk embroidery,.....Fitch.
Bronner Bros., Syracuse, case bonnets and millinery goods, ...Trans.
Mrs. Ann Algire, Liverpool, patchwork quilt, ...Barry.
Miss Catharine Hingle, Syracuse, patchwork quilt,.....S. S. M.
Mrs. H. Schermerhorn, Syracuse, patchwork quilt,.....Trans.
Mrs. Louisa Wilson, Syracuse, embroidered vest, ...Thomas.
Mrs. S. Carhart, Williamsburgh, silk embroidered child's blanket,..Fitch.
Mrs. S. J. Bush, Elbridge, specimen wax fruit and flowers,.....S. S. M.
Miss E. M. Brace, Salina, Grecian painting,.....Barry.
Mrs. Geo. Reed, Camden, wax doll, dressed by Miss Ella Reed, six years old,.....Fitch.
Mrs. Wesley Hickox, Syracuse, wax flowers and shell work,.....Fitch.
Miss Charlotte A. Pattison, Onondaga Valley, Oriental stand, ...Barry.
Mrs. S. L. Howard, Syracuse, hair flowers,.....S. S. M.
Mrs. S. L. Howard, Syracuse, Oriental paintings,.....Buist.
Mrs. S. L. Howard, Syracuse, hair jewelry, ... Trans.
Mrs. E. T. Crocker, Syracuse, 5 frames ocean moss,..... S. S. M.
Mrs. E. T. Crocker, Syracuse, 5 Grecian paintings,..... Dip.
Mrs. E. T. Crocker, Syracuse, frame flower work,..... Barry
Miss Cornelia Fitch, Watervale, case hair flowers, ... Trans.
Miss Harriet R. Ackerman, Three Mile Bay, oil paintings,..... S. M.
Miss Elizabeth Conant, Salina, patchwork quilt,..... Fitch
Miss Louise M. Riggs, Turin, pair chenille embroidered slippers, S. butter knife.
Mrs. N. Eaton, Syracuse, wax fruit and oriental painting,..... Trans.
Mrs. Geo. Reed, Camden, chenille head dress and embrodered skirt, Barry
Mrs. Mary Ann Murray, Buffalo, lamp mat, ... S. S. M.
Mrs. S. J. Bush, Elbridge, pellice work,..... Trans.
Mrs. Margaret Morey, Syracuse, 70 years old, 3 patchwork quilts,.. Dip.
Mrs. George Trowbridge, Camden, chair tidy and silk grass victorine, S. M.
Mrs. E. J. Gilbert, Salina, quilt, ... Trans.
Miss Laura E. Terry, Geddes, (7 years old,) patchwork quilt, ... Fitch
Mrs. Marietta Jenks, Gowanda, specimen silk embroidery, ... Trans.
Mrs. Laura J. Stone, Oswego, 1 bed quilt, ... Thomas
Miss Emily Finn, Syracuse, 25 pieces cotton crotchet work,.. Dip. & Fitch
Miss Rhoda Van Waggoner, Syracuse, (under 14,) pair worked slippers, ... Fitch
Mrs. C. L. Davenport, Syracuse, patchwork quilt, ... Trans.
Miss Henrietta McChesny, Salina, specimen painting and drawing,.. Barry

Miss "Hattie" A. Hubbard, (9 years old,) Oneida Lake, specimen embroidery, ... S. S. M.
Mrs. F. Dodge, Syracuse, specimens embroidery, ... Thomas
Mrs. F. Dodge, Syracuse, specimen embroidery, by girl 12 years old, ... Fitch
Mrs. Mary Buckley, Syracuse, night dress and chemise, ... Trans.
Miss E. M. Brace, Salina, shell and moss work, ... Thomas
Mrs. D. Hinsdell, Manlius, fancy lamp mat, ... Thomas
Mrs. D. S. Severence, Truxton, patchwork quilt and cushion, (girl 6 years, ... Fitch
Miss Sarah M. Porter, Salina, family hair wreath, (by girl 13 years,) S. S. M.
Mrs. L. Worden, Syracuse, specimen needle work, ... Buist
Miss Jane A. Clark, Onondaga Valley, specimen pencil drawing, S. S. M.
Miss Jane A. Clark, Onondaga Valley, linen and cambric embroidery, Fitch
Mrs. J. H. Van Nostrand, Camillus, 1 turkey feather muff,..... S. S. M.
Mrs. Daniel Conger, Wolcott, patchwork quilt by girl, ... Dip.
Mrs. S. J. Bush, Elbridge, pellice work, ... S. S. M.
Miss Mary Bailey, Geddes, silk, linen and worsted embroidery,.. Thomas
Mrs. W. B. Abbott, Salina, worsted embroidery, ... Trans.
Mrs. S. H. Davis, Fulton, 3 embroidered skirts,..... Barry
Miss Jennie Way, Syracuse, embroidery,..... Fitch
Mrs. N. Lewis, Fulton, 10 reticule satchels,.....Thomas
Miss Mary Dolphin, Salina, Grecian painting by girl 10 years old,. Fitch
Miss C. A. Pattison, Onondaga Valley, pellice work "Atarjai,".. S. S. M.
Mrs. J. Balsley, Fayetteville, basket and patchwork quilt,..... S. S. M.
Mrs. H. McDonald, Jack's Reefs, Onondaga co., embroidered skirt,. Trans.
Mrs. Levi B. Lord, Phelps, child's cloak and cape,.....Thomas
Mrs. Grace A. Hall, Marcellus, 3 oil paintings,.....S. S. M.
Mrs. M. Davidson, Salina, embroidered slippers and chemise,..... Fitch
Mrs. E. T. Crocker, Syracuse, specimens of knitting 6 stockings at one time by Mrs. E. Miller, 67 years old,.....Thomas
Miss M. T. Pomeroy, Otisco, lamp mats, ... Fitch
Mrs. E. T. Crocker, Syracuse, wax fruit and mignionette,..... Barry
Mrs. B. F. Green, Salina, lamp mat, ... Trans.
Mrs. Thomas Spence, Tully, patchwork quilt by lady 69 years old,. S. S. M.
Miss Harriet Le Roy, Camillus, Oriental painting, family group,. do
Mrs. James Holloway, Syracuse, ottoman covers and teapot stand, Trans.
Mrs. Wm. Way, New York, transferred needlework pocket handkerchief,..... Trans.
Mrs. L. E. Way, Onondaga Valley, specimens needlework, ... Trans.
Francis Bardwell, Otisco, crotchet tidy by an invalid girl 12 years old, ...S. S. M.
Mrs. N. B. Cook, Syracuse, case millinery,..... Trans.

Miss Elizabeth Wells, Syracuse, specimens needlework and embroidery, ... Fitch
Miss Emily M. Joslyn, 15 years old, Oneida Castle, bouquets wax flowers, ... S. M.
Miss C. W. Williams, Manlius, ornamental painting, ...S. S. M.
Mrs. G. Jewett, Moravia, pocket handkerchief and tidy's,.....S. S. M.
Miss Isabella A. Bingham, Syracuse, crotchet tidy's,..... Fitch
Miss C. McKnight, Syracuse, white down cape and muff,..... S. M.
Miss Maria T. Norcross, Syracuse, Grecian, Antique and Oriental paintings,.....S. S. M.
Miss Maria McChesney, Wilson, wreath of hair flowers,..... Dip.
Mrs. M. R. Baker, Syracuse, bead work,..... Trans.
Mrs. Jas. R. Lawrence, Syracuse, oil paintings,..... do
Mrs. John Remsen, Cazenovia, lamp mats,.....S. S. M.
Mrs. Samuel Hurst, Syracuse, Grecian painting, ... Trans.
Mrs. Wesley Hickox, Syracuse, Grecian painting,..... do
Miss Mary A. Griffen, Syracuse, lady's night dress and chemise, ..S. S. M.
Miss Carter, Upperville, Va., knit hearth rug, composed of 50,000 pieces and 100,000 stitches, ... S. M.
Mrs. George Wilkins, Syracuse, hair wreath, ... Trans.
Mrs. H. E. Allen, Buffalo, portrait "Black Hawk chief,"..... Barry
Joseph Peron, St. Regis, N.Y., 6 samples bead work, ... Trans.
Miss Marion Cole, Cedarville, pencil drawing and Antique painting, ... Fitch
Mrs. A. P. Sigourney, Watertown, patchwork quilt,.....Thomas
Miss Mary Lewis, Syracuse, embroidered skirt and collar, ... Fitch
Miss Sarah J. Warne, Sennett, hair wreath,..... do
Mrs. Ira Johnson, Waterloo, patchwork quilt, ... Trans.
Mrs. Grace A. Hall, Marcellus, oil painting, ... do
Thomas Skenandoah, Onondaga Castle, beadwork table cloth,.... S. M.
G. Towne, Rutland, N.Y., white quilt,..... Trans.
Mrs. R. Herriman, Syracuse, oil pointings,..... do
Mrs. J. W. Peters, Fonda, shell card basket,..... S. M.
Mrs. O. F. Burt, Syracuse, infants blanket,.....Thomas
Mrs. Thomas Earl, Salina, shawl,.....Downing
P. H. Hanlon, Syracuse, 5 fancy pictures and frames, ... Dip.
Clara Stowell, Syracuse, gent's linen by girl 4 years of age,.....Thomas
Miss E. Allbright, Dryden, linen embroidery,..... do

No. 64.—Paintings, &c.

Best specimens of animal painting in oil, J. R. Page, Sennet, Cayuga Co.,.....Dip. and S. M
2d best, nearly equal to the first, Mrs. W. H. Sotham, Oswego, do
Best do in water colors, F. M. Rotch, Morris,..... do
Best do in oil, by foreign artist, H. Strafford, London,..... Dip.
Best fruit drawing, Mrs. Geo. Van Zandt, Rochester,..... do
2d best, Mrs. Geo. Van Zandt, Rochester,..... do

Best flower painting, Mrs. George Van Zandt, Rochester,.....Dip.
Best Monochromatic drawing, B. F. Green, Syracuse,..... do
Best 3 lithographs, J. Sage and Sons, Buffalo,..... do
Best colored photographs in oil, J. Winter, Syracuse, ... do
One portrait in oil, life size, J. Winter, Syracuse, ... do
Pencil drawings, cattle, A. J. Howes, Weedsport, ... do
Union Agricultural Society of Ridgeway and Shelby, Orleans county, for framed diploma, ...Dip. and Trans.

CLASS 7.

No. 65.—Silver Ware, Cutlery and Britannia.

Best exhibition of silver ware, Joseph Seymour & Co., Syracuse,...S. M.
Best specimen of silver ware with agricultural designs, suitable for premiums, Joseph Seymour & Co., ...S. M.

Too much praise cannot be given to these designs for spoons, cups, goblets, &c.

Best specimen plated saddlery hardware, Olmsted & Jones, Syracuse, S M.

No. 66.—Cooking Stove.

Best elevated oven cook stove for wood, Rathbone & Co., Albany,..S. M.
2d best, Wm, Tefft, Jr., Syracuse, ...S. S. M.
Best low oven cook stove for wood, Treadwell, Perry & Norton, Albany,.....S. M.
2d best, McCarthy, Radigan & Downs, Syracuse, "Stewart's,"....S. S. M.
Best cooking range for famiiies, L. Schwartz, Syracuse,.....S. M.
Best low oven cook stove for coal, McCarthy, Radigan & Downs, Syracuse,.....S. M.
2d best, Rathbone & Co., Albany,.....S. S. M.

Discretionary.

Agricultural furnace, J. S. & M. Peckham, Utica,.....Dip.
Cooking stove, D. Campbell, Syracuse, "Nonpareil," .....S. M.
Cooking stove for hotels and academies, Rathbone & Co., Albany, "Leviathan,".....S. M.

The committee would mention that J. C. Henderson, of Albany, has on exhibition a new and improved stove, recently patented, and known as the "Albanian," for burning soft or bituminous coal. The more perfect combustion of the smoke and gases of bituminous coal, is of the greatest importance, especially so when the vast amount of this description of fuel with which the country abounds is taken into account. The western world is supplied with no other. This improvement seems to meet a very decided want, consuming effectively and entirely the smoke and gases emitted (heretofore lost) in the use of soft coal. It seems equally effective in the use of other fuels. This stove has been awarded the *highest premium*, but this notice is nevertheless deemed due to it.

GEORGE F. GRAY,
JOHN WINSLOW,
GEORGE O. DANIELS,
Committee.

No. 67.—Stoves, Parlor.

Best ornamental parlor stove, D. G. Stafford, Syracuse,.....S. M.
2d best, Rathbone & Co., Albany, ...S. S. M.
Best hall stove, J. C. Henderson, Albany, the "Albanian,"..Dip. & S. M.
2d best, P. Schemel, Syracuse, the " McGregor,".....S. S. M.
Best sample of hollow ware, Treadwell, Perry & Norton, Albany, S. S. M.
Best parlor grate, J. C. Henderson & Co., Albany, ...S. M.
Treadwell, Perry & Norton, Albany, parlor stove,.....Dip.
McCarthy, Radigan & Downs, Syracuse, assorted stoves,.....Dip.
Wm. Tefft, Syracuse, coal stove and hollow ware, ...Trans.
J. S. & M. Peckham, Utica, " model parlor top,".....Dip.
L. Schwartz, Syracuse, " Rathbone's union gas burner,".....Dip.
Rathbone & Co., Albany, best assortment of stoves,.....Dip.
Sand oven stove, Treadwell, Perry & Norton, Albany,.....Dip.
Littlefield's railway coal burner, D. Campbell, Syracuse,..Dip. and S. M.

No. 68.—Leather, &c.

Best straw shoe, J. Buswell, Utica, ...Dip.
Best manilla do do ..... do
Best trunk, French dress box, A. H. Sager, Syracuse,..... do
Best ladies' boots and shoes, McDougal, Fenton & Co., Syracuse,.... do
Best traveling bag, G. W. Hamilton, Oneida,..... do
Best fine boots, George W. Lewis, Utica,..... do
Best harness leather, Van Buren, Smith & Co., Syracuse,..... do
Best calf-skins, do do ..... do
Best upper-leather, do do ..... do
Best kip skins, do do ..... do
Best glove leather, Elihu Walter, Syracuse,..... do
Best sole leather trunk, John Hoye, Syracuse, ... do

No. 69. Cabinet ware.

Eliptic spring bed bottom, Eliptic Spring Bed Co., N.Y., " Howe's patent," ..... Dip.
Howe's eliptic spring for night cars, ... S. M.
Model dentists' chair, Geo. W. Tripp, Auburn,..... Dip.
Two fancy chairs, C. Cook, Syracuse, ...S. S. M.
Iron beadstead, B. Hinckley, Troy,..... Dip.
Wood do do .....S. S. M.
Extension table, E. T. Griffith, Syracuse,..... Trans.

No. 70. Carriages.

Best double carriage, B. C. Dunbar & Co., Syracuse, ... Dip.
Best single top buggy, S. C. Brewster, Geddes,.....Dip. & S. M.
Best single riding buggy, A. Parshall, Springfield Center, Otsego county,..... Dip.
Best pleasure wagon, R. & W. H. White, Auburn,..... do

No. 71. Clothing, hats, furs, &c.

Best exhibition men's hats and caps, W. P. Sabey, Syracuse, ... Dip.
Best collection of furs, W. P. Sabey, Syracuse,..... do

No. 72. *Discretionary. Vide Report, ante* 275.

72 A. Sewing machines.

Best family sewing machine (Wheeler & Wilson's), E. Robbins, Syracuse,..... Dip.
2d do (Grover & Baker's) H. R. Phelps, Syracuse,..... S. M.
Best for manufacturing purposes (Singer's) C. B. Hall, Syracuse,. Dip.
Single thread machines (Johnson's patent), Geo. Barney, Syracuse,. S. S. M.
Single thread machines (Lathbury's), G. C. Lane, Buffalo,..... Trans.

72 B. Pianos.

Best, M. A. Decker, Albany,..... Dip.
2d do Allen & Phelps, Syracuse,..... S. M.
3d do D. L. Fry & Co. (for elaborate finish), ... S. S. M.
Best reed organ, M. O. Nichols, Syracuse,..... Dip.
Best melodeon, do do ..... do

72. C. Fire engines.

Higgs & Townsend, Utica, fire hydrant,..... S. S. M.
do do hose coupling..... Trans.

72 D. Wines.

Best collection, consisting of "Isabella," "Diana," "Currant," and "Blackberry," E. S. Bartholomew, Westfield,..... Dip.
Best Metheglin, C. W. Moseley, Onondaga,..... do
Best Raspberry, H. H. Doolittle, Oaks Corners,..... do
Fleming's celebrated ale, Wm. Fleming, Albany, ... S. M.

FLOWERS, &c.

No. 73. Cut flowers.—Professional list.

Best collection, Thorp, Smith & Hanchett, ... $10

DAHLIAS.

Best collection, Thorp, Smith & Hanchett, ... 6

ROSES.

Greatest number and best varieties, Thorp, Smith & Hanchett, ... 8
Newest and best 24 varieties, with names, do 5
Newest and best 12 varieties, do 3

PHLOXES.

Greatest number and best varieties, Thorp, Smith & Hanchett, ... 5
Best 12 varieties with names, do 3
Best seedling not before exhibited, do 2

CARNATIONS.

Best display monthly carnations, Thorp, Smith & Hanchett,..... 3

VERBENAS.

Greatest number newest and best varieties, Thorp, Smith & Hanchett,. 5
Newest and best 12 varieties with names, do .. 3
Best collection of 3 varieties American seedlings, not before exhibited, Thorp, Smith & Hanchett,..... S. M.

GERMAN ASTERS.

Best collection, Thorp, Smith & Hanchett,.....Cup, val. $10

PANSIES.

Best collection, Thorp, Smith & Hanchett, ... 3

TEN WEEK STOCK.

Best Collection, Thorp, Smith & Hanchett,..... 3

No. 74. AMATEUR LIST.—CUT FLOWERS.

The display in this department was limited and inferior, and hardly reputable, and certainly not creditable, or worthy of a State exhibition.

D. D. T. MOORE,
C. B. SEDGEWICK,
WM. WEBSTER,
Committee.

Best display, Hamilton White. Syracuse, ...S. M.
2d do Mrs. J. T. Van Namee, Pittstown,..... $2

DAHLIAS.

Best 12 dissimilar blooms, with names, J. T. Van Namee, ... 3
Best 6 dissimilar blooms, Mrs. J. T. Van Namee, ... 2

ROSES.

Best 12 varieties, with names, Hamilton White, Syracuse,..... 3
2d do Mrs. J. T. Van Namee, ... 1
Best 6 varieties, with names, Hamilton White, Syracuse, ... 2
2d do Mrs. J. T. Van Namee, ... 1

VERBENAS.

Greatest number newest and best varieties, Hamilton White Syracuse, 5
2d do do Mrs. J. T. Van Namee,.. 3
Best 12 distinct varieties, with names, J. T. Van Namee,..... 3
2d best, Hamilton White, Syracuse, ... 1
Best 6 varieties, Mrs. J. T. Van Namee, ... 2
Best seedling not before exhibited, Hamilton White, Syracuse,..... 2

PHLOXES.

Greatest number best varieties, J. T. Van Namee, ... 4
2d do do Mrs. J. T. Van Namee, ... 2
Best 6 varieties, J. T. Van Namee,..... 2
Best seedling not before exhibited, Hamilton White, ... 1

GERMAN ASTERS.

Best collection, Hamilton White, ... 3
2d best, J. T. Van Namee,..... 1

PANSIES.

Best collection, Mrs. J. T. Van Namee,..... 3
2d best, Hamilton White,..... 1

TEN WEEK STOCK.

Best display, Hamilton White, ... 3
2d best, Allen Munroe,..... 1

No. 75. General List—Pot Plants.

Best collection of house plants, 20 specimens, Hamilton White, Syracuse, ... Siver cup, value $10
2d best, Thorp, Smith & Hanchett, ... 5
Best 12 plants in pots, Thorp, Smith & Hanchett, ... 5
2d best, Hamilton White, Syracuse, ... 3

FLORAL DESIGN.

Best, Allen Monroe, Syracuse, ... 5
2d best, Mrs. S. Love, Ithaca, ... 3

BOUQUETS.

Best pair hand, Thorp, Smith & Hanchett, ... 5
2d best, Allen Munroe, Syracuse, ... 3
Best pair parlor, Thorp, Smith & Hanchett, ... 5
2d best, A. Munroe, ... 3

Discretionary.

Allen Munroe, Syracuse, plants in pots, ... Norton's Prize Essay.
P. Barber, Homer. plants in pots, ... Fitch on Insects.
Thorp, Smith & Hanchett, Syracuse, plants in pots, ... Downing.
Hamilton White, Syracuse, floral ornament, ... do
Hamilton White, Syracuse, hand bouquets, ... Barry,
James M. Mattison, Jacksonville, hand bouquets. ..... Downing.
Hamilton White, Syracuse, parlor bouquets, ... Thomas.
Joseph Kellogg, Ithaca, hand bouquets, ... Downing.
F. C. Dillaye, Syracuse, grass bouquets, ... do
Joseph Kellogg, Ithaca, collection of verbenas, ... do
Miss C. A. Pattison, Onondaga Valley, bouquet dried grasses, .. do

CLASS VIII.

No. 76.

Greatest variety apples, Thorp, Smith & Hanchett, Syracuse, ... Siver cup, value $15
Best 20 variety apples, Thorp, Smith & Hanchett, Syracuse, ... Plate value 10
Best 12 varieties, Thorp, Smith & Hanchett, Syracuse, ... 5
Greatest number good variety pears, Thorp, Smith & Hanchett, Syracuse, ... Silver cup, value 15
2d do Ellwanger & Barry, Rochester, ... Silver cup, value 10
Best 20 varieties pears, Ellwanger & Barry, Rochester, ... Silver plate, value 10
2d best, Thorp, Smith & Hanchett, Syracuse, ... 5
Best 12 varieties pears, Thorp, Smith & Hanchett, Syracuse, ... Plate, value 8
Best 6 varieties pears, Thorp, Smith & Hanchett, Syracuse, ... Plate, value 5

SPECIAL.

Best 2 varieties apples, "King of Tompkins County," and "Wagner," E. C. Frost, Havana, ... 3

PEACHES.

Best 1 variety, 12 specimens, "Jersey Yellow," N. Culver, Newark, $2

CLASS 8.

No. 77.—Professional List.

PLUMS.

Greatest and best varieties, Thorp, Smith & Hanchett, Syracuse, Plate valued $5
2d best, Ellwanger & Barry, Rochester, ... 3
Best six varieties, Thorp, Smith & Hanchett, ... 3

QUINCES.

Best dozen, Ellwanger & Barry, Rochester, ... 2

GRAPES.

Best number native varieties, G. E. Ryckman, Brockton, Plate valued 5
2d best, Jas. M. Mattison, Jacksonville, ... 3
Best single variety, Wm. Brookbanks, Hudson, ... 2

WATERMELONS.

Greatest and best varieties, N. Culver, Newark, ...Plate, valued 5
Best specimens, W. Day, Syracuse, ... 2
2d best, Thorp, Smith & Hanchett, Syracuse, ... 1

MUSKMELONS.

Best specimen one variety, G. E. Ryckman, Brockton, ... $2
2d best, N. Culver, Newark, ... 1

Discretionary.

G. W. Hamilton, Oneida, preserved fruit, ...Dip.
Wm. Brookbanks, Hudson, fine dish Rebecca grapes, ...Dip.

No. 78.—Class 2.—Amateur List.

APPLES.

Greatest number of varieties, Geo. Cross, DeWitt, Silver cup, value $15
2d best, John J. Hopper, Onondaga Valley, ... 10
Best 20 varieties, A. G. Owen, Big Flat, ...Plate, value 10
2d best, Geo. Cross, DeWitt, ... 5
Best 12 varieties, W. P. Ottley, Phelps, ... 5
2d best, G. Nottingham, Syracuse, ... 3

PEARS.

Best 12 varieties, H. G. Dickinson, Lyons, ...Plate, 8
2d best, E. Boardman, Rochester, ... 5
3d best 6 varieties, G. W. Lawrence, Oswego, ... 3

PEACHES.

Best 6 varieties, John J. Hopper, Onondaga Valley, ... $4
Best 1 variety, H. G. Dickinson, Lyons, ... 2

Discretionary.

Best 12 varieties apples, James Pierce, Oswego, ... $3
Best 12 varieties pears, James Pierce, Oswego, nearly equal to those to which the prizes were given, ... 5

No. 79.—Amateur List.

PLUMS.

Best 1 variety, A. C. Powell, Syracuse, ... 2
2d best, Grove Lawrence, Syracuse, ... 1

QUINCES.

Best dozen, E. S. Hayward, Rochester, ... 3
2d best, Geo. Plumb, Fairmount, ... 2

GRAPES.

Greatest number of good native varieties, A. S. Moss, Fredonia, Chautauque county, ...Plate, value 5
2d best, R. Cossitt, Onondaga county, ... 3
Best 1 variety, R. Cossitt, Onondaga, ... 2
Greatest number of varieties, and best specimen foreign grapes, grown under glass, Hamilton White, Syracuse, ...Plate, value 10
2d best, Hamilton White, Syracuse, ... 6

WATERMELONS.

Best specimen, Allen Munroe, Syracuse, ... 2
2d best, Allen Munroe, Syracuse, ... 1

MUSKMELONS.

Best specimen, Allen Munroe, Syracuse, ... 2
2d best, M. Ormsby, Onondaga, ... 1

CRANBERRIES.

Best peck domestic cultivated, Noble Hill, Caton, ...Plate, value 5
2d best, D. L. Halsey, Victory, ... 2

POMEGRANATES.

Best specimen, Mrs. C. Yeomans, Clay, ...Trans.

No. 80.—Foreign Fruit.

PEARS.

Greatest number of varieties, 3 specimens of each, Hovey & Co., Boston, Mass., ...Cup. value 15
Best 20 varieties, Hovey & Co., Boston, Mass., ...Plate, value 10

Mr. Hovey's splendid collection of pears, 92 varieties, did not arrive until after the committee had left. They were worthy of the premium awarded by the executive committee.

CRANBERRIES.

Peck cultivated cranberries, from Addison Flint, North Reading, Mass., large size, good appearance, well deserving a favorable notice of the committee, ...Dip.

PREMIUMS AWARDED FEB. 10, 1859.—WINTER MEETING.

FARMS.

L. D. Clift, Carmel, Putnam Co., grazing farm, 1st premium, ... $50
Grain farms, under 50 acres, S. Walrath, Canton, St. Lawrence Co., 1st premium, ... 50
Grain farms, over 50 acres, L. Sherrill, Greenville, Greene Co., 2d premium, ... 30

CHEESE DAIRIES.

1. James S. Jackson, Leyden, ... 50
2. Norman Gowdy, Lowville, ... 30
L. S. Standring, Denmark, special premium, ... Silver Medal.
Clemence Whitaker, Martinsburgh, specially commended.

BUTTER DAIRIES.

1. J. C. Collins, West Turin, Lewis Co., ... $50
Hanford & Olmstead, Walton, Delaware Co., statement of butter dairy proceeds, special premium, ... Silver Medal.
Essay—Robert L. Pell, New York, on the edible fishes of New York, Plate, value 100

DRAINING.

1. William Johnson, Geneva, ... $20
2. Jonathan Talcott, Rome, ... 10
S. Walrath, Canton, special premium, ... Silver Medal.

PREPARED GRASSES, FOR MUSEUM.

1. Mrs. J. T. Van Namee, Pittstown, ... $15

COLLECTION OF GRAINS IN STRAW.

1. Mrs. J. T. Van Namee, Pittstown, ... $10

FIELD CROPS.

Spring Wheat—Solomon Walrath, Canton, St. Lawrence Co., the quantity of land not sufficient, crop at rate of 40 bushels per acre, specially commended.
O. W. Blair, Verona, experiments in corn culture, ... Trans.
1. Barley—Norman Gowdy, Lowville, 50 bushels, ... $15
1. Rye—C. L. Kiersted, Kingston, 44 do 15
1. Oats do do 115 do 15
1. Corn do do 92½ do 15
2. B. S. Carpenter, Baldwin, Chem'g co. 80 do 10
Peas—Ira R. Peck, East Bloomfield, 1st premium, ... 8
Beans—S. Walrath, Canton, St. Lawrence Co., ... Medal.

POTATOES.

1. Levi Hanford and Hiram Olmstead, Walton, Delaware Co., 1 6-160 acres, 233 bushels, 1st premium, ... $8

RUTA BAGAS.

Levi Hanford and Hiram Olmstead, ...Vol. Trans.

MANGEL WURTZEL.

1. Thomas Messenger, Great Neck, 1st premium,..... $8

WINTER FRUIT.

Apples—Best 20 varieties, J. W. Bailey, Plattsburgh,...Diploma and $4
Best 10 do, W. P. Ottley, Phelps, Ontario Co.,.....Diploma and 3
Second best do, W. Ives, Watertown,.....Barry and 1
Third best, J. M. Mattison, Tompkins Co., ...Trans.
Best plate (Baldwin) W. P. Ottley, Phelps, Ontario Co.,...Silver Medal.
Second best, J. M. Mattison, (Tompkins County King,) .....Thomas.
Grapes—best sample, (Isabella,) R. P. Wiles, Albany, very superior, Silver Medal.

BUTTER.

Best 3 firkins, William H. Pugh, Lewis Co.,..... $15
2d best, Hiram Mills, Lowville, do 10
3d best, L. L. French, Richfield Springs, Otsego county, ... 5

Butter made June, August and November.

Best 3 firkins, B. S. Carpenter, Elmira, Chemung county,..... 15
One tub of butter, Miss Jane E. Mills, Lowville, 14 years old, very superior, special premium, ...Pair butter knives.

Winter made Butter.

Best, Mrs. E. Merriam, Leyden, Lewis Co., ... $5
2d best, Norman Gowdy, Lowville, ... 3
3d best, Miss Walrath, Canton, St. Lawrence Co., ...Trans.
4th best, Miss Van Auken, Phelps, Ontario Co., ...Trans.

CHEESE.

Best, Norman Gowdy, Lewis county,..... $15
2d best, Theron Van Auken, Phelps, Ontario Co.,..... 10

WINTER WHEAT.

1. White, Wm. P. Ottley, Phelps, Ontario co.,..... 3
2. Red, O. Howland, Auburn, Cayuga co., ... 2
3. do Wm. P. Ottley, Phelps, Ontario co.,..... 1

SPRING WHEAT.

1. Tea wheat, H. Blodget, Denmark, Lewis co., ... 3
2. Wm. P. Coonradt, Brunswick, Rensselaer co., ... 2
3. O. Howland, Auburn, Cayuga co.,..... 1

RYE.

1. Wm. P. Coonradt, Brunswick, Rensselaer co., ... 3
2. B. S. Carpenter, Baldwin, Chemung co., ... 2
3. C. L. Keirsted, Kingston, Ulster co.,..... 1

BARLEY—TWO ROWED.

1. Norman Gowdy, Lowville, Lewis co., ... $3
2. O. Howland, Auburn, Cayuga co., ... 2
3. Wm. P. Ottley, Phelps, Ontario co., ... 1

BARLEY—FOUR ROWED.

1. B. S. Carpenter, Baldwin, Chemung co., ... 3

OATS.

1. D. A. Mackey, Rensselaerville, Albany co., ... 3
2. Henry Wier, Pittstown, Rensselaer co., ... 2

CORN.

1. Yellow, C. W. Eells, Westmoreland, Oneida co., ... 3
2. Solomon Walrath, Canton, St. Lawrence co., ... 2
3. H. Blodget, Denmark, Lewis co., ... 1

WHITE CORN.

1. Henry Wier, Pittstown, Rensselaer co., ... 3
2. B. S. Carpenter, Baldwin, Chemung co., ... 2
3. New York State Agricultural College, Ovid, Seneca co., ... 1

BUCKWHEAT.

1. B. S. Carpenter, Baldwin, Chemung co., ... 3
2. L. L. French, Herkimer co., ... 2
3. Wm. P. Coonradt, Brunswick, Rensselaer co., ... 1

BEANS—WHITE.

1. Wm. P. Coonradt, Brunswick, Rensselaer co., ... 3
2. Solomon Walrath, Canton, St. Lawrence co., ... 2
3. Wm. Newcomb, Johnsonville, Rensselaer co., ... 1

PEAS.

1. Norman Gowdy, Lowville, Lewis co., ... 3
2. O. Howland, Auburn, Cayuga co., ... 2

TIMOTHY SEED.

1. S. Carey, Albany, ... 3
2. O. Howland, Auburn, Cayuga co., ... 2
3. H. Blodget, Denmark, Lewis co., ... 1

CLOVER SEED.

1. W. P. Ottley, Phelps, Ontario co., ... 3
2. S. Carey, Albany, ... 2

SWEET CORN.

Wm. P. Coonradt, Brunswick, Rensselaer co., ... Vol. Trans.
Wm. Newcomb, Johnsonville, Rensselaer co., ... Vol. Trans.

FLAX SEED.

Henry Weir, Pittstown, Rensselaer co., two samples, one red and one white, ... Vol. Trans.

MILLET.

Henry Weir, Pittstown, one sample, ... Vol. Trans.

Sample of oats—"Potato Oats"—E. Merriam, seed from Bay Chaleurs, Canada, a fine sample, ...Vol. Trans.

Discretionary premiums.

Sugar cane syrup, W. P. Ottley, Phelps, Ontario co., ... $2
Maple sugar, H. Blodget, Denmark, Lewis co., ... 2
Turkeys, W. P. Ottley, ... 2
do 2d premium, Wm. Richardson, Albany, ... 1
Pease & Eggleston, portable hoeing machine, ... Dip.
do cultivator, ... Dip.
do harrow, ... Dip.
S. E. & M. P. Jackson, Boonville, mower and reaper, ... Dip.
E. E. Servis, Hubbard's combined reaper and mower, ... Dip.
Mrs. W. Ives, Watertown, currant wine, ...Downing
P. Bauer & Co., Buffalo, 3 samples farina, ... Trans.
M. Hallenbeck, Albany, model mowing machine, ... Trans.
E. C. Rowland, Phelps, self-opening gate, ... Dip.
Emery Brothers, Albany, churn with dog power attached; horse power speed and safety attachment; circular saw for sawing wood; overshot separator and thrasher, ... Dip.
Emery Brothers, Sanford's improved farm mill, ...S. M.
Volney Burgess, Isabella grape wine, 6 years old, very fine, ... Dip.

Hon. A. B. Dickinson, Hornby, exhibited a new draining plow, which attracted much attention, and was fully explained, as to its operation, by Mr. Dickinson. It promises, in stiff clay soil, to reduce very materially the cost of drainage, and is within the means of every farmer.

FIFTH REPORT

ON THE

NOXIOUS AND OTHER INSECTS

OF THE

STATE OF NEW YORK.

By ASA FITCH, M. D.

ENTOMOLOGIST OF THE NEW-YORK STATE AGRICULTURAL SOCIETY.

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INSECTS INFESTING DECIDUOUS FOREST TREES.

Such a multitude of worms and other insects as feed on the leaves and other parts of our deciduous forest trees, I find it will be impossible for me to fully comprise in a single Report. I therefore here present the more common and pernicious ones, with a few others which are less common but whose history has never before been published. The oaks being our most important trees of this class, and attacked by a far greater number of insects than any of our other forest trees, will claim a principal part of our present Report.

1. THE OAKS.—*Quercus alba, etc.*

AFFECTING THE ROOT.

A disease to which the different kinds of oaks, in Europe, are subject, and to a less extent the beech and other forest trees, shows itself in the form of small excrescences or galls about the size of ground nuts, which grow upon the slender thread-like roots of the trees. These excrescences are caused by a small insect which punctures the root and forces an egg into the opening. The irritation which this egg occasions causes an increased flow of sap to the part, whereby it swells and grows into one of these gall-nuts. In the center of each of these nuts lies a small white footless worm, which eventually changes into an insect of the gall-fly kind, but which differs remarkably from all the other insects of the group to which it pertains, in being wholly destitute of wings. It has hence received the specific name *aptera*, and forms a distinct genus named *Biorhiza* by Mr. Westwood. I suppose this name to be derived, not from *βίος,, life*, as its orthography would indicate, but from *βία, injury*, and *ῥίζα, a root*, and if so it should be written *Biarhiza* instead of as we find it in books.

The roots of forest trees being so seldom exposed to our view, I know not whether similar excrescences occur upon them in this country. But it is quite probable that they do, since wingless gall-flies occur here, closely resembling that of Europe. I have repeatedly met with these in forests,

upon the surface of the snow, on mild days in the fore part of winter. The warmth of the trunks of the trees melts the snow where it is in contact with them, as every woodman is aware, producing a crevice or vacant space down to the ground immediately around the tree; and I infer that it is through this opening that these insects ascend from the roots of the trees, and wander about upon the snow, to find and pair with their mates, after which they again descend to insert their eggs in the roots; for it is at this period of the year that their eggs are deposited, as we learn from seeing them frequently extruded by recently captured individuals. Their eggs are minute oval white grains, and are coated over with a glutinous white fluid, by which, when the female is impaled, they are held together in a continuous string. And this substance, in which the eggs of these as of other gall-flies are enveloped, is supposed by its acridity to produce the irritation of the vegetable tissues which causes the growth of the singular tubers and excrescences in which the young of these insects are cradled.

The genus *Biarhiza* is defined by authors as being destitute of wings and having the antennæ composed of fourteen joints in the females. It may further be added that these organs are thread-like and nearly as long as the body. The abdomen also is strongly compressed, as it is in the flea, to which insect these wingless gall-flies have considerable resemblance. When viewed in profile the abdomen is broad egg-shaped with its smaller end attached to the thorax; its sutures are marked by fine impressed transverse lines; and its first segment is very large, about equal in length to all the remaining segments. The abdomen is much more smooth and shining than the head and thorax, which are bearded with minute gray hairs, the head being broader than the thorax, and appearing about twice as broad as long when viewed from above.

We have in the State of New York three insects which will pertain to this genus as above characterized. One of these may appropriately be named from its color,

290. The Black gall-fly, *Biarhiza nigra*, new species. (Hymenoptera. Cyniphidæ.)

This is of a black color throughout, including its feet and antennæ, and like the kindred European species, it is destitute of any vestiges of wings. It measures but eight hundredths of an inch (0.08) in length.

The two other species to which I have alluded, possess abortive or rudimentary wings, in the form of small whitish and feebly transparent scales, reaching about a third of the length of the abdomen. These scales are of a long oval shape, rounded at their tips, and are densely covered with minute punctures, and bearded with exceedingly fine short hairs. A straight sub-costal or rib-vein of a brown color, extends about half their length, parallel with the outer margin, and ends abruptly without curving towards the margin. The scales representing the hind wings are shorter and narrower than the forward ones. In addition to the difference now stated, the last segment on the under side of the body, from out the hind edge of which the ovipositor is protruded, is much more strongly elevated

than in the preceding species, forming a kind of sheath for the ovipositor, and is fringed with rather long shining yellowish or golden hairs which project backward, resembling a little tuft or brush when the body is viewed from one side. These differences seem to require that these two insects should be regarded as generically distinct from the first, and I therefore propose the name *Philonix* (φιλος, *a lover*; νιψ, *snow*) for a genus for their reception. This genus coincides with *Biarhiza* in the number of joints to the female antennæ, which is the only sex yet discovered, but differs in having rudimentary wings and the ventral valve more prominently elevated and ciliated with longish hairs. It may further be observed that the jaws of these insects resemble those of an ant, being blunt at their tips, and three-toothed, the inner tooth more slender and deeply separated from the middle one, which latter is divided from the outer one by merely a slight notch. And their feelers or maxillary palpi are four-jointed, the two first joints cylindric, the third shortest and narrowed from its apex to its base, and the last joint slightly thicker than those which precede it, egg-shaped, and clothed with bristles, the two joints next to it also having a whirl of bristles at their tips.

291. YELLOW-NECKED GALL-FLY, *Philonix fulvicollis*, new species. (Hymenoptera. Cyniphidæ.)

This measures 0.13 to 0.15, and is the species which I have most frequently met with. It is black with the thorax tawny yellow, spotted anteriorly with black, the scutel brighter yellow, and the legs dusky or blackish with the knees and hips of a paler dull yellowish color, the antennæ being black to their bases. The thorax when carefully inspected shows a broad black stripe on its fore part, on each side of which is a small oval black spot, and farther down upon each side, forward of the wing-sockets, is a large triangular black spot.

These insects exhale a perceptible odor, resembling that of ants or bees. They are oftenest met with on the first snows that fall, in the latter part of November and the beginning of December, and wholly disappear, I think, before the close of the latter month. They are found in our forests, associated with the Thick-legged snow-fly, *Chionea valga*, Harris, and the little Snow-born and Mid-winter Boreus, *Boreus nivoriundus et brumalis*, Fitch; and it is a curious fact that these several insects inhabiting the surface of the snow, and pertaining to widely different orders, all correspond with each other in being destitute of wings. Why they are thus deprived it is difficult to conceive. They hereby resemble small spiders in their appearance, several kinds of which occur upon the snow in company with them. And it may be that they thus escape from being noticed and devoured by the birds, a few species of which, pressed by hunger, are industriously foraging our forests in winter.

292. BLACK-NECKED GALL-FLY, *Philonix nigricollis*, new species.

This is smaller than the preceding, being rather less than 0.12 in length, and is black with the basal third of the antennæ and the legs obscure

brownish-yellow and the scutel dull yellow. The inner sides of its thighs are slightly dusky.

AFFECTING THE TRUNK.

293. Locust Cossus, *Cossus Robiniæ*, Peck. (Lepidoptera. Hepialidæ.)

Boring large holes in the solid wood of the different kinds of oaks and also in the locust, admitting the air and moisture to the interior of their trunks and causing their decay; a large cylindrical worm of a bright rose red color, with several purple pimples symmetrically arranged, each yielding a hair, its under side greenish white, with sixteen legs, and its head shining black; when fully grown three inches in length and as thick as one's finger, and then appearing of a dull flesh-color instead of red and its head tawny yellow; passing its pupa state in a cocoon in the tree, and coming abroad in June and July, a large thick-bodied moth of a gray color with a black stripe on each side of its thorax, and its fore wings with black clouds and a net-work of black lines, when extended measuring three inches in width; the male smaller and more colored with black, with the hind half of its hind wings bright orange yellow, its width 2.00 to 2.30.

Of all the wood-boring insects in our land this is by far the most pernicious, wounding the trees the most cruelly. The stateliest oaks in our forests are ruined, probably in every instance where one of these borers obtains a lodgment in their trunks. It perforates a hole the size of a half-inch auger, or large enough to admit the little finger, and requiring thre or four years for the bark to close together over it. This hole running inward to the heart of the tree, and admitting the water thereto from every shower that passes, causes a decay in the wood to commence, and the tree never regains its previous soundness.

This is also a most prolific insect. The abdomen of the female is so filled and distended with eggs that it becomes unwieldly and inert, falling rom side to side as its position is shifted. A specimen which I once obtained, extruded upwards of three hundred eggs within a few hours afte its capture, its abdomen becoming diminished hereby to nearly half its previous bulk; and in the analogous European species more than a thousand eggs have been found on dissection. It hence appears that a single one of these insects is capable of ruining a whole forest of oak trees. This calamity, however, is prevented, probably by most of the eggs being destroyed, either by birds or by other insects, for these borers are by no means so common in our trees as the fecundity of their parents would lead us to expect.

An account of this insect was first given in the year 1818, in an article written by the late Prof. Peck, but published anonymously, in the Massachusetts Agricultural Repository, vol. v. pp. 67–73. Having bred the moth from larvæ which he found in the locust (*Robinia Pseud-acacia*) and ascertained its intimate relationship to the European goat-moth, named *Bombyx Cossus* by Linnæus and *Cossus ligniperda* by Fabricius, Prof. Pec k bestowed the name *Cossus Robiniæ* upon our insect. Dr. Harris

has also given an account of it in his Treatise, p. 316, under the name *Xyleutes Robiniæ*. This renders a few words of explanation necessary, to unscientific readers, particularly since in one or two instances heretofore I have followed Dr. Harris in sanctioning names which on more mature reflection I regard as invalid.

It is now a well established rule or law with men of science, that a specific name when once validly imposed upon any plant or animal can never afterwards be changed. This rule, however, was disregarded by Fabricius when he formed a separate genus to include the Goat-moth and other similar insects, as he took the name *Cossus* which Linnæus had given to that moth as the name for this new genus and gave another name to this species; thus in effect robbing Linnæus of the honor of having named and described this insect. Hubner, therefore, proposed the name *Xyleutes* for this genus, in order that the name *Cossus* might be restored to its typical species. But, on the other hand, it is to be observed that the law alluded to had no existence in Fabricius' day; the very course which he pursued was at that period the established rule, sanctioned by the example of his illustrious preceptor—Linnæus himself having in repeated instances selected his previous specific names as the names of genera of which those species were the types, hereupon giving new names to the species. Thus our common *Lampyris* (*Photinus*) *corrusca*, Linn., was originally the *Cantharis Lampyris*, Linn. Fabricius, therefore, so far from violating, conformed strictly to the received rules of his day in this matter. And to condemn him now, upon an *ex post facto* law, will be grossly unjust. Moreover, to cancel the several generic names which are in the same category with the one before us, and which have been universally current in our books for nearly a century past, will be too great an innovation to be tolerated, except the propriety and justice of such a step were perfectly clear. We hence regard the name *Cossus* as the legitimate designation of the genus to which the insect before us pertains.

Dr. Boisduval has recently described this moth as a new species, (Annales Soc. Ent., 2d series, vol. x, p. 323,) though under the same name, *Cossus Robiniæ*, he having doubtless found it thus ticketed in some of the Paris collections and being unaware that it had been previously described.

Prof. Peck states that he had repeatedly seen this same locust worm and its burrows in the wood of the black oak. Dr. Harris more cautiously says a larva which cannot be distinguished from this, occurs in the red oak. Having bred several of these moths from larvæ in the white oak, I have ascertained them to be identical with the species described as infesting the locust. And my observations lead me to the belief that, in the State of New-York at least, these insects are bred in the oaks to a much greater extent than in the locust, for I have never seen an instance of their large perforations in the wood of the locust, whilst in the oaks they have been noticed repeatedly, and for many years before I knew what insect was t e culprit that occasioned this serious michief. I therefore enter it under

this head. Fortunately this insect is not a common one. If it were so, few of the oaks in our forests could escape being ruined by it. From the specimens sent me from the southern and south-western states, I infer it to be more common there than it is with us. And we learn from Boisduval that it also occurs in California.

The European analogue of this insect is popularly termed the Goat or the Goat-moth, this designation having been bestowed upon it in consequence of the strong odor which it exhales, resembling that of the goat. Locust goat-moth might therefore be the most suitable common name for our insect, were it not that it is destitute of the odor alluded to, no perceptible scent being given forth either by the larva, or by the moth, even when the latter has newly burst from its pupa shell. I therefore deem the name Locust Cossus the most appropriate by which to designate this insect in common conversation.

This moth pertains to a small group or family named *Hepialidæ*, which is intermediate in its characters between the twilight or crepuscular moths and the nocturnal, and is usually arranged at the head of the latter in systematic works, preceding the large species forming the Bombyx family. The *Hepialidæ* are distinguished by having the spiral tongue, the palpi or feelers, and the spurs of the hind legs wholly wanting or very small. And the genus *Cossus* may be known by its tapering antennæ, which are as long as the thorax and pectinated or comb-like in both sexes, the branches or teeth being thick and short and continued to the tips of these organs. Authors usually state further that there is but a single row of these teeth to the antennæ ; but in this species there are two rows. The name *Cossus* which this genus bears, Pliny states was the name anciently given by the Romans to a worm found under the bark of the oak, which they were accustomed to fatten by feeding it meal, and to eat, it being esteemed a great delicacy.

Our moth comes abroad as already stated in June and the fore part of July. It flies only in the night time, remaining at rest during the day, clinging to the trunks of trees, its gray color being so similar to that of the bark that it usually escapes notice. In repose its wings are held together in the shape of a roof, covering the hind body. From observing her motions in confinement, I think the female does not insert her eggs into the bark, but merely drops them into the cracks and crevices upon its outer surface. They are coated with a glutinous matter which immediately dries and hardens on exposure to the air, whereby they adhere to the spot where they touch : and if the short two-jointed ovipositor be not fully exserted as the egg is passed through it, so as to carry the egg beyond the hair-like scales with which the body is clothed, some of these touching adhere to it, their attachment to the body being so slight.

The eggs are of a broad oval form, and about half the size of a grain of wheat, being the tenth of an inch in length and three-fourths as thick, of a

dirty whitish color with one of the ends black. When highly magnified their surface is seen to be reticulated or occupied by numerous slightly impressed dots arranged in rows like the meshes in a net. From the fact that several worms of the same size are sometimes met with in a single tree, indicating them all to be the progeny of one parent, it appears that the female drops a number of eggs upon each tree that she visits, and probably disposes of her whole supply upon a very few trees. The size of the eggs doubtless renders them a favorite article of food to some of our smaller birds. And a bird on discovering one of these eggs, will be incited thereby to search for others in the same vicinity, which search being successful, will be perseveringly continued so long as an egg can be found upon that or any of the adjacent trees. Thus it may be that of the whole stock of eggs which a female deposits, scarcely one escapes being picked up and devoured. This appears the most probable cause of so few of these worms being met with, although the females are so prolific.

The worm on hatching from the egg sinks itself inward and feeds at first on the soft inner bark, till its jaws acquiring more strength, it penetrates to the harder sap-wood and finally resorts to the solid heart-wood, residing mostly in and around the centre of the trunk, boring the wood here usually in a longitudinal direction, and moving backwards and forth in its burrow, enlarging it by gnawing its walls as it increases in size, whereby the excavation comes to present nearly the same diameter through its whole length. In an oak in which I met with two worms fully grown and several others but half grown, the whole of the central part of the trunk had been extensively mined by preceding generations of this insect and was in a state of incipient decay. And I thus had an opportunity to notice the fact that none of the worms were lying in the decaying wood, all being outside of this, where the wood was still sound. Hence it is evident that it is living healthy trees which this insect prefers, and not those which are sickly and decaying; which latter are preferred by the European Cossus, some authors say, though perhaps their observations have not been exact upon this point; for in the instance here alluded to, it would have been said on a first glance that these worms preferred decaying wood, since the diseased heart of the tree was everywhere traversed with their burrows, and the sound wood showed few of them. And thus no doubt in many other cases we mistake the cause for the effect, and on seeing semi-putrid wood filled with worm-holes we suppose the worms have preferred wood of this character when in truth it is these holes which have caused the decay of the wood.

These worms are probably three years in obtaining their growth. They cast off their skin several times, and after the last of these moultings their color becomes different from what it has previously been.

The LARVA previous to the last change of its skin is of a rose red or a pale cherry red color, often with a faint yellowish stripe along the middle of its back, on all except the three anterior rings. It is of a cylindrical form, slightly broadest anteriorly and a little flattened beneath. It is divided by transverse constrictions resembling broad shallow grooves, into twelve

rings, which are twice as broad as long. On each of these rings are a few pimples of a deep purple color, regularly placed, each giving out a pale brown bristle. Four of these pimples are on the back, placed at the angles of an imaginary square or a trapezoid having its hind side the longest, the two hinder pimples being larger. Small white dots confluent into broken lines may also be perceived, forming a transverse square in which the two anterior pimples are inclosed, and other dots less regularly placed, surrounding the two hind pimples except upon their hind side. Above the breathing pores on each side is also a large pimple, which, upon the four rings bearing the pro-legs, has a white dot in its lower edge, which dot does not appear in the corresponding pimples of the other rings. A minute pimple is also seen forward of the upper end of each breathing pore, below which all the under side of the worm is greenish white. The breathing pores are oval and light yellow, with a rusty brown oval spot in their centre and a dark purple ring around their outer edge. Below them the skin bulges out, forming a longitudinal ridge, or rather two parallel ridges divided by a deep intervening furrow. Upon the upper one of these ridges near the middle of each ring is a round cherry-red spot in which are two small pimples, and on the lower ridge is a single one, placed farther back, whilst four others, equally minute, may be seen farther down and around the anterior base of the pro-legs. The second and third rings are shorter, each with fourteen pimples of different sizes, the larger ones forming a single transverse row. The first ring or neck is polished and of a dark tawny brown color on its upper side, with a white line in its middle disappearing anteriorly in a black two-lobed cloud. The head is but half as broad as the body, and is of a shining black color, tinged more or less with chestnut brown in its middle, with scattered punctures from which arise fine hairs. The antennæ are chestnut brown, conical and three-jointed, the last joint minute, with a bristle beside it given out from the apex of the second joint. The palpi are similar, with two small processes from the summit of their second joint, the outer one of which ends in a minute fourth joint. Of the eight pairs of legs, the three anterior are conical and end in a single chestnut-colored claw. The others are short, thick and retractile, with their soles surrounded by a blackish fringe-like ring composed of a multitude of minute hooks, the last pair, however, having these hooks only around the anterior and outer half of their soles. Placed in a glass or tin vessel this worm is perfectly helpless, being unable to cling with these hooks to a hard smooth surface.

With the last change of its skin it loses its bright red color and is then white, tinged with green at the sutures, and with a pale green stripe along the middle of its back which disappears at the sutures. The pimples are of a pale tawny yellow color with black centres. The head is light tawny yellow varied in its middle with greenish white, its anterior edge blackish and the jaws deep black.

As the moth into which this worm changes possesses no jaws or other implements by which it is possible for it to perforate the wood, it is necessary for the worm to prepare a way for its future escape from the tree. And the provisions which it makes for this end are truly interesting, indicating that the worm has a clear perception of what its future condition and requirements will be, both in its pupa and its perfect state. This is the more surprising when we recur to the fact that since its infancy this creature has been lying deeply bedded in the interior of the tree, the only act of its life having been to crawl lazily around in its cell and gnaw the wood there, when impelled by hunger. How does it now come to do anything different from what it has been doing for months and years before? But, having got its growth and the time drawing near to have it change into a pupa or chrysalis, we see it engaging in a new work. It now bores a passage from the upper end of its cell, outward through the wood and bark till only a thin scale of the brittle dead outer bark remains. It is usually at the bottom of one of the large cracks or furrows in the bark that this passage ends, whereby the hole inside is less liable to be discovered by birds. The worm then diligently lines the walls of this hole with silken

threads interspersed with its chips and forming a rough surface resembling felt, as it withdraws itself backwards for a distance of about three inches, thus placing itself beyond the reach of any bird or other enemy outside of the tree, should its retreat be discovered. And it here incloses itself in a cocoon which it spins of silk, of a long oval form, having the end towards the outer opening much thinner and its threads more loosely woven. In this cocoon it throws off its larva skin and then appears in its nymph or pupa form.

The PUPA is an inch and three-quarters long and half an inch thick, of a dull chestnut color, the rings of its abdomen paler, and on the back near the anterior edge of each ring is a row of angular teeth, resembling those of a saw, of a dark brown color, and all of them inclining backward, these rows of teeth extending downwards upon each side below the breathing pores or about two-thirds of the distance around the body. On the middle of each ring is also a much shorter row of little tubercular points. Finally, upon the under side of the last segment are about four stouter conical teeth, the tips of which are drawn out into sharp points which are curved forward, so that when this last segment, which is tapering and smaller than the others, is bent downwards, these curved points will catch and hold the body from moving forward.

The pupa lies perfectly dorment in its cocoon probably a fortnight or longer. It then awakes from its slumbers and begins to writhe and bend itself from side to side. By this motion the rows of little teeth upon the rings of its abdomen, which incline backward as above described, catch in the threads of the cocoon, first upon one side and then upon the other, and thus move the body forward, whereby its head presses upon the loosely woven end of the cocoon, more and more firmly, until it forces its way through it, and the pupa works itself forward out of its cocoon. And the same writhing motion being continued, the teeth now catch in the threads with which the sides of the hole are lined, and thus though destitute of feet the pupa moves itself along, till it reaches and breaks through the thin scale of bark which hitherto has closed the mouth of its burrow, and pushes itself onward till about three-fourths of its length protrude from the tree, when by curving the tip of its body downward, the four little hooks thereon catch in some of the threads and hold it from advancing further and falling to the ground. By so much motion of the pupa the connections of the inclosed insect with its shell become sundered and the sutures of the shell are probably cracked open, so that the moth readily presses them apart and crawls out therefrom, leaving the empty and now lifeless shell projecting out from the mouth of the hole, with a small mass of worm-dust surrounding it.

The MALE moth is of a gray color from white scales intermixed with black ones. The *head* is furnished upon the crown or vertex with longer or hair-like scales. The antennæ are tapering and many-jointed, their basal joint thickest and covered with black and gray scales, the remaining joints being naked, shining, coal-black, each joint bearing two branches on its front side, forming two rows of coarse teeth like those of a comb, the teeth being six or more times as long as thick, and all of the same length except at the base and tip, where they become shorter, all of them ciliated with fine hairs. The feelers are appressed to the face and reach as high as to the middle of the eyes, and are cylindric, clothed with short appressed scales, the separation of the terminal joint being slightly perceptible. The *thorax* has the shoulder-covers black, forming a stripe of this color along each side, which anteriorly curves

downwards and is continued backward upon the upper side of the breast. Its base is clothed with larger scales, forming tufts upon each side. The *abdomen* is conic and equals the tips of the wings in its length, and is but slightly covered with scales except along each side, where they form a broad stripe, the under side being entirely denuded; it is black and shining, with the sutures dull yellowish. At its tip are three appendages, longer than the last rings of the abdomen. The two lower ones are broad thick flattened processes of a dull brownish yellow color, with their tips rounded and slightly bent inwards towards each other. The upper one is a slender black shining hook or claw of the same length, its tip sharp-pointed and curved downward. Above these appendages and hiding them from view is a brush of black hairs, forming a conical tuft at the end of the abdomen, blunt at its apex. The *legs* are more or less denuded of scales, black and shining, with the hind shanks thicker towards their tips and with two pairs of spurs, the forward shanks having only a single spine which is placed on the middle of their inner sides, the same as in other moths; and the feet are compressed, and five-jointed, with the basal joint longest and the following ones successively shorter. The *fore wings* are black with groups of whitish scales forming gray spots or clouds which are netted with black lines, varying greatly in different individuals. Often a transverse gray spot is situated towards the base and another on the anal angle, the outer and hind margins being gray alternated with black. The *hind wings* are black with their posterior half of a rich marigold yellow color bordered with a black line upon the hind margin, the yellow color being irregularly notched on its anterior side and narrowed to the inner angle, and not extended to the outer angle, the two outer cells being black. The outer or anterior margin, except at its base and tip, is usually gray alternated with transverse black streaks and blotches, and inside of this is a large ash-gray spot occupying the outer anterior part of the disk. The under sides of both wings is similar to their upper surface.

The FEMALE would not be supposed to pertain to the same species with the male, her size is so much larger, her colors so much paler gray, and her hind wings being wholly destitute of the bright yellow coloring which forms so conspicuous a mark in the other sex. The branches of her antennæ are also shorter, being but about four times as long as thick. The ground color of her fore wings is gray, variously netted with black lines dividing the gray in places into small roundish spots and into rings having black centres. The black color usually forms a broad irregular band across the middle of the wings parallel with the hind margin, and another between this and the hind edge, chiefly on the outer half of the wing, the hind edge and fringe being whitish alternated with black spots placed on the tips of the veins. The hind wings are dusky gray and towards their bases blackish, their posterior half being feebly transparent and faintly netted with darker lines. The body is densely coated with gray scales, its under side hoary white; and the legs are gray with black bands on the shanks and black feet with gray rings at their articulations.

We have but a single suggestion to make upon the subject of remedies against this truly formidable though fortunately rare enemy. It is probable that soft soap applied the fore part of June to the bodies of trees will be equally efficacious against this and other borers as it is against that of the apple tree. This remedy may well be resorted to, to protect the locusts and oaks which we value as ornamental trees; and scarce and valuable as timber is becoming in all the older settled sections of our country, I doubt not it will be found to be good economy to bestow similar attention upon the more valuable trees standing in our forests.

It should also be observed that whenever a hole made by a borer is discovered in the trunk of a tree, it should be immediately closed by inserting a plug therein, to exclude the wet which will otherwise be admitted hereby to the interior of the tree and produce a decay of the surrounding wood.

294. OAK COSSUS, *Cossus Querciperda*, new species.

A moth smaller in size than *C. Robiniæ*, with thin and slightly transparent wings which are crossed by numerous black lines, the outer margin

only of the forward pair being opake and of a gray color; the hind wings of the male colorless, with the inner margin broadly blackish and the hind edge coal-black.

This description will suffice to distinguish a species of which the two sexes were recently found at rest upon the trunk of an oak tree in Schoharie, by I. A. Lintner, Esq. It is altogether probable from these facts that it is a borer in the oak, with other habits similar to those of the preceding species. This discovery is the more interesting, since, so far as I am aware, the Locust Cossus has hitherto been the only species of this genus known as inhabiting our country, the *Cossus Pyrini* of Fabricius evidently pertaining to the genus *Zeuzera*.

The Pigeon Tremex, *T. Columba*, I have met with inserting its eggs in the oak, but being much oftener found in the maple, will be described under that head.

295. Northern Brenthus, *Arrhenodes septentrionis*, Herbst. (Coleoptera. Attelabidæ.)

Perforating a cylindrical hole about the tenth of an inch in diameter, transversely through the bark and into the solid wood of standing, and much more often of newly felled trees, and thrusting its chips out at the orifice; a slender cylindrical whitish worm an inch or more in length and scarcely 0.10 in diameter, with three pairs of legs on its breast and a thick fleshy pro-leg at its tip, its last segment horny and dark chestnut colored, and obliquely hollowed at its end, forming a kind of scoop with little teeth along its edge; changing in its burrow to a long yellowish white pupa, having its head bent down under its breast and its long beak lying between its leg and wing-sheaths, its back with transverse rows of little sharp teeth and two sharp spines at its tip; changing into a long cylindrical beetle about 0.60 in length, of a mahogany brown color, it wing-covers usually black and with narrow tawny yellow spots upon the rounded spaces between the furrows, its thorax egg-shaped and highly polished, its head ending in two large jaws in the male, and in the other sex a slender cylindrical beak with small jaws at its tip, whereby it bores into the bark and then pushes an egg into the opening.

Though most common in oaks this beetle is not limited to wood of this kind. On removing the loose bark from fallen trees it will sometimes be seen projecting partly out of its burrow in the wood; but the collector will most readily supply himself with specimens among the piles of sawed oak lumber in mill yards in May and June. It differs remarkably in its size. I have a specimen the total length of which is but 0.25, and which is proportionably slender. It was one of these dwarfs from which Drury described this species under the name *minimus*, long anterior to Herbst. But this being the name of a mere variety, it cannot supplant the name subsequently given, which has been universally adopted and is highly appropriate, since the several species nearest akin to this all inhabit warm climates. And Olivier hence deemed South Carolina to be the northern-

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most extent of the geographical range of this species, and that the name given it by Herbst was therefore inapplicable. He consequently proposed the name *maxillosus* for this species. The insect, however, occurs in all parts of the United States and Canada.

296. GRAY-SIDED WEEVIL, *Pandeleteius hilaris*, Herbst. (Coleoptera. Curculionidæ.)

A smaller perforation than that of the preceding insect, containing a worm resembling that of the plum curculio, and which is the young of a weevil met with upon the leaves of the oak from May till the last of September, 0.20 long and of a pale brown color, its wing-covers on each side usually gray bordered above with black, and sending two gray branches obliquely inwards towards the suture, with very stout fore legs and a short broad beak having a furrow along the middle of its upper side; with its beak boring a hole in the bark and placing an egg therein. See Harris' Treatise, page 61.

297. SILKY TIMBER-BEETLE, *Lymexylon sericeum*, Harris. (Coleoptera. Lymexylonidæ.)

Boring small long cylindrical burrows in the wood of the oak, probably, and other trees; a slender odd-looking worm with six legs placed on its breast, a prominent hump upon its neck, and a leaf-like fleshy appendage at the end of its back; changing into a long narrow chestnut-brown beetle, 0.50 long, bearded with short, shining, yellowish hairs, giving it a silky lustre, its eyes large and almost meeting together above and below, and its wing-covers tapering and shorter than the body. See Harris' Treatise, p. 51.

298. AMERICAN TIMBER-BEETLE, *Hylecœtus Americanus*, Harris. (Coleoptera. Lymexylonidæ.)

A worm very similar to the preceding, but with a straight sharp-pointed horn at the end of its back in place of a leaf-like appendage; changing into a pale brownish-red beetle 0.40 long, its wing-covers, except at their base, and its breast black, its eyes small and a glassy dot on the middle of its forehead resembling a small eyelet. See Harris' Treatise, p. 51.

This and the preceding are very rare insects, and their larvæ have never been detected, but are inferred by Dr. Harris to inhabit oaks and to have the singular forms above indicated, from the analogy of the perfect insects to two European species. Foreign writers, I see, are misled by Dr. Harris's account, into supposing that it is authentically ascertained that our insects coincide in their larva state with the European species.

299. FEEBLE OAK-BORER, *Goes debilis*, Leconte. (Coleoptera. Cerambycidæ.)

A cylindrical long-horned beetle, which has recently been described by Dr. Le Conte, under the above name, is so uniformly found upon white oak trees in July and August, that I doubt not its larva is a borer in the trunks of these trees, perforating the wood, probably, in a manner similar to that of the marked pine borer. No. 230, and the worm resembling that

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in its appearance. This beetle is half an inch long and scarcely a third as broad, of a black color, its wing-covers chestnut red, its surface having a marbled appearance, produced by short prostrate hairs of a dull ochre yellow color, except on the anterior half of the wing-covers, where they are gray, and are here followed by a tawny brown spot destitute of these paler hairs. It has only been found, as yet, in the State of New York, in the northern sections of which it is not rare.

300. THUNDERBOLT, *Arhopalus fulminans*, Fabricius. (Coleoptera. Cerambycidæ.)

Excavating a burrow in the soft sap-wood, about three inches long and 0.20 in diameter, this burrow having the shape of a much bent bow or a letter U ; a worm similar to that of the apple-tree borer, which passes its pupa state in the same cell and produces a long-horned beetle which comes abroad the beginning of July, and is three times as long as broad, varying from a half to nearly three-fourths of an inch in length, of a black color, with transverse zigzag gray lines often broken into small spots on its wing-covers, and readily distinguished from all other species by its thorax, which is nearly globular and gray, with a large egg-shaped coal-black spot on the middle of its upper side.

301. WHITE-BANDED PHYMATODES, *Phymatodes albofasciatus*, new species. (Coleoptera. Cerambycidæ.)

A black long-horned beetle 0.25 in length or slightly less, and about a third as broad, somewhat flattened, clothed with fine erect gray hairs, its wing-covers with two distinct slender white bands which do not reach the suture, the anterior one more slender than the hind one and curved, the antennæ and slender portions of the legs usually chestnut colored.

Several specimens of this beetle were met with a few years since, the last of May, on the trunk of a black oak, in which, it is probable, their younger state had been passed. It is closely related to the black varieties of *P. varius* Fab., but is a third smaller, with the white bands much more slender, and the surface of the wing-covers are perceptibly more rough than in my specimens of that insect, notwithstanding their smaller size. Its thorax is densely punctured, with a short smooth stripe between the centre and the base. One of the specimens varies in having the posterior white band wholly wanting.

Several others of our long-horned beetles are usually found upon oaks, in the trunks or limbs of which the larvæ probably reside.

302. TOOTH-LEGGED BUPRESTIS, *Chrysobothris dentipes*, Germar. (Coleoptera. Buprestidæ.)

A slender, winding, serpent-shaped worm-track between the bark and wood of newly felled trees ; formed by a white footless grub, its anterior end enormously large, round and flattened ; sinking itself probably slightly into the wood to pass its pupa state ; producing a flattish oblong purplish-black beetle about 0.50 in length, coppery beneath, its face brassy and

with two smooth raised dots, its thorax with two smooth raised stripes separated by an intervening groove; often found basking in the sunshine on the bark of the trees in June and July. See Harris's Treatise page 43.

The APPLE BUPRESTIS, No. 3, before apple trees were introduced upon this continent, was cradled in the oaks, and is still frequently found in them. It is also probable that others of the American species of this same genus, of which there are quite a number, whose preparatory state are yet unknown, are nurtured in the oaks.

The larvæ of the HORN-BUG, No. 6—very large, soft white grubs, with their bodies doubled together in the shape of the letter U, their tips, which are thick and of a livid bluish gray color as though discolored from being bruised, being held against their breasts—are quite common in the damp putrid wood in the centre of old trees and in their stumps, and also occur in the decaying sapwood. The larvæ also of the BIG-EYED SNAPPING BEETLE No. 9, and of several other beetles of smaller size than these, are found in the same situations.

303. QUERCITRON BARK BORER, *Graphisurus fasciatus*, Degeer. (Coleoptera. Cerambycidæ.)

Feeding upon and destroying the quercitron bark (the inner bark of the black oak, *Quercus tinctoria*,) of newly felled trees, forming large tracks therein which are filled with worm-dust, and in an oval cavity at the end of these tracks a white footless grub about 0.60 long and a fourth as broad, slightly tapering, and with a transverse oval tawny yellow spot on the middle of each ring above and below; changing to a pupa lying naked in the same cavity, and in June coming out, a long-horned beetle about 0.50 long and a third as broad, of an ash-gray color freckled with blackish spots and punctures, and back of the middle of its wing-covers an irregular oblique black band, the female with a tail-like ovipositor.

The black oak is most highly valued for its bark, the quercitron of commerce, yielding a bright yellow dye. The bark of the dead tree, it is said, is not at all inferior for coloring purposes, to that cut from living trees. But unless this bark is peeled immediately after the tree falls to the ground, it becomes very much worm-eaten and nearly worthless. The worms which burrow in and destroy it are produced by a long-horned beetle differing remarkably from all the other beetles of this group in that the female is furnished with a straight awl-like ovipositor nearly a quarter of an inch in length, projecting horizontally backwards from the end of her body. The importance of this implement becomes manifest when we observe the thickness of the bark of the black oak, with its outer layers so dry and hard that they form as it were a coat of mail, protecting the trunk of the tree against the attacks of its enemies. Equipped as she is, however, the female of this beetle is able to perforate this hard outer bark and sink her eggs through it, placing them where her young will find themselves surrounded with their appropriate food. The worms from these

eggs mine their burrows mostly lengthwise of the grain or fibres of the bark, and the channels which they excavate are so numerous and so filled with worm-dust of the same color with the bark, that it is difficult to trace them. The eggs are deposited the latter part of June, and the worms grow to their full size by the close of the season, and will be found during the winter and spring, lying in the inner layers of the bark, in a small oval flattened cavity about an inch in length, which is usually at the larger end of the track they have travelled.

This LARVA is divided by transverse constrictions into twelve rings, the last one being double. The head is small and retracted more or less into the neck, its base white and shining, and its anterior part deep tawny yellow, and along each side black. The neck or first ring is much longer as well as thicker than any of the others, the two rings next to it being shortest. From the neck the body of the worm is slightly tapered backwards to the middle, from whence it has nearly the same diameter to the tip, where it is bluntly rounded. Upon the upper side of the neck, occupying the basal half of this ring, is a large transverse tawny yellow spot, rounded upon its forward side, but no corresponding spot appears on the under side of this ring. On the middle of all the other rings except the two last, both above and below, is an elevated, rough, transverse, oval spot, of a tawny yellow color.

The BEETLE, like other species of the family to which it pertains, varies greatly in its size, specimens before me being of all lengths, from 0.35 to 0.58. It is of an ash-gray color from short incumbent hairs or scales, which have a faint tinge of tawny yellow except along the suture of the wing-covers. It is also bearded with fine erect blackish hairs which arise from coarsish black punctures which are sprinkled over the thorax and wing-covers, several of which punctures are in the centre of small black dots, which in places are confluent into small irregular spots. The head is of the same width as the anterior end of the thorax, and has a deep narrow furrow along its middle its whole length, and on the crown is an oval blackish spot on each side of this furrow. The face is dark gray, and the antennæ are black with an ash-gray band occupying the basal half of each of the joints. The thorax is narrower than the wing-covers, more broad than long, and thickest across its middle. Upon each side slightly back of the middle is an angular projection or short broad spine, blunt at its tip. On the middle of the back between the centre and the base is a short impressed line, and on each side of this, extending the whole length of the thorax is a wavy blackish stripe, which is suddenly widened towards its hind end, and is sometimes interrupted in its middle. Often, also, there is a blackish spot between the anterior ends of these stripes, extending from the centre of the thorax to its forward end. The scutel is ash-gray in its middle and black upon each side. The wing-covers almost always show a large oblique and irregular triangular spot of black on their outer side forward of the middle, and always behind the middle is an irregular black oblique band, which seldom reaches to the suture, and which has a notch in the middle of its anterior side and opposite to this on its hind side a large angular projection extending backward. Immediately back of this band is an irregular spot of a paler black color, which is sometimes confluent with the band; and there is also a small blackish spot on the outer side of the tips. The tips are cut off, sometimes transversely in a straight line, but usually concavely, and sometimes presenting a slight tooth-like projection on each side. The legs are ash-gray, the thighs with two black spots on their upper side, and the shanks with a black band at their base and another at their tip, these bands being more broad on the hind pair.

On elevating the loose bark of fallen trees the fore part of June, these insects will be found therein, lying in the cavities already mentioned, some of them being still in their pupa state, whilst others are changed to their perfect form, ready with the stout jaws and sharp teeth with which they are furnished, to gnaw their way through the bark and come abroad.

This species occurs throughout the United States and Canada. Different specimens of it, however, vary greatly in their aspect. Even when newly

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born, among the individuals in the bark of the same tree, considerable diversities in size and markings may be noticed. And the beetles found in this situation have their colors so much brighter and their spots and bands so much more distinct and clearly defined, that I supposed them to be a different species from *fasciatus* for several years, and until specimens came to hand showing a gradual transition from these to the older individuals which we usually capture abroad, and meet with preserved in cabinets, in which the colors have become faded and dim and the marks obscure and partially obliterated. In the shape of some of its parts, also, different specimens are liable to vary. And I cannot persuade myself that the species named *pusillus* by Kirby is really distinct from the one under consideration. Dr. Le Conte supposes it may be distinguished by its smaller size, and by the spine on each side of its thorax being smaller and perfectly straight on its hind side, instead of concave. But in the smallest specimen in my collection, measuring but 0.35, this spine is about as prominent as in any of the larger ones, and its hind margin is straight, as it is also in several other examples, one of which is 0.58 in length. This form of the spine, therefore, is not peculiar to the smaller sized specimens. Moreover, in one instance before me, this margin is wavy instead of straight, and in several others it is straight nearly to its outer end, where it suddenly curves outward by reason of the tip of the spine being slightly prolonged or attenuated; whilst in other cases still, this margin is regularly concave or curved through its whole length. We thus, in different specimens, meet with a regular gradation from the straight margined spines of *pusillus* to the concave of *faciatus*, as these species are distinguished by Dr. Le Conte; showing that no such difference as has been supposed, really exists in nature. And we therefore regard the *pusillus* of Kirby as being merely a dwarf variety of this species.

304. Oak Leiopus, *Leiopus Querci*, new species. (Coleoptera. Cerambycidæ.)

A very small long-horned beetle, which I am unable to refer to any of the described species, I am assured lives at the expense of the red and white oak, from meeting with it upon those trees standing apart from others in fields. As the larvæ of kindred species burrow in the bark of trees, this will probably be found in the same situation in oaks. The beetle is met with upon the leaves of these trees early in July. It is very closely related to the Facetious Leiopus, No. 286.

It is 0.20 long, and black with ash-gray wing-covers, which are punctured and marked with a large black spot on the base of their suture in the form of a cross, and a broad black band slightly back of their middle, which is angulated, somewhat resembling an inverted letter W, this band often having a small ash-gray spot placed in it near its outer ends. Forward of this band are two black dots or short lines on each wing-cover, and sometimes a third dot back of it. There is also a dusky spot, usually, on the tips of the wing-covers, and their deflected outer margin is black. The wing-covers are rounded at their tips. The thorax sometimes shows three faint gray stripes above. It is narrowed anteriorly, and on each side slightly forward of the base is a short, broad, sharp-pointed spine, from the tip of which, for-

ward, the sides are straight. The long thread-like antennæ are dull yellow, with a slight duskiness at the end of each joint. The legs are blackish with the bases of the thighs, and frequently of the shanks also, pale dull yellow, the hind thighs being less thickened towards their tips than the four forward ones.

AFFECTING THE LIMBS AND TWIGS.

305. OAK PRUNER, *Elaphidion putator*, Peck. (Coleoptera. Cerambycidæ.)

[See Report Third, plate 2, fig. 2.]

The limbs towards their ends cut smoothly off, transversely, the latter part of summer, and found through the autumn and winter lying on the ground beneath the trees with their withered leaves adhering to them; a hole bored in their severed end, and extending up their center, in which lies a white footless worm, over a half inch long and a fourth as broad, slightly tapering and divided into twelve rings by very broad deep constrictions; changing to a somewhat active pupa within the limb, from which in June comes a slender cylindrical long-horned beetle half an inch long, of a dull black color with brownish wing-covers which have two sharp points at their tips and ash-gray hairs forming small spots here and there, its thorax with coarse close punctures and its under side and legs chestnut colored.

The singular habit of this insect of severing the limb in which it is cradled and dropping itself herein to the ground, varying its operations to accord with the size and nature of the limb, renders it one of the most interesting native species of our country. Its biography has never yet been written, that I am aware, except very imperfectly. The leading facts in its life were first made known in the year 1819, by Prof. Peck, in an article published in the Massachusetts Agricultural Repository, vol. v. pp. 307—311, accompanied with a plate; and some slight additions are made thereto, by Dr. Harris, in his Treatise, p. 86.

The purpose for which this insect cuts off the limb, is probably as Prof. Peck, suggests; as the worm is to remain in the limb through the winter, it appears to forsee that, from being wounded as it is, it will perish and become too dry if it remains elevated in the air; it therefore drops it to the earth, where, lying among the fallen leaves and buried beneath the winter's snows, it remains moist and adapted for the development of the insect within it.

The severed limbs are usually but eighteen inches or two feet in length, but Prof. Peck states that limbs an inch in thickness and five feet in length are sometimes found. I have seen a limb cut off by this insect, which was ten feet in length and an inch and a tenth in thickness, and have repeatedly met with them seven and eight feet long, and usually an inch, but in one instance an inch and a quarter in thickness.

The parent beetle seems aware that her progeny, in their infancy, will be too feeble to masticate the hard woody fibres of the limb. She therefore selects one of the small twigs which branch off from it, which is not thicker than a goose quill, with its base composed of soft wood, the growth

of the last year, all the remainder of the twig being the green succulent growth of the present year. She places her egg near the tip of this twig, in the angle where one of the leaf-stalks branch off from it. The young worm which hatches therefrom sinks himself into the center of the twig and feeds upon the soft pulpy tissue around him until it is all consumed, leaving only the green outer bark, which is so thin and tender that it withers and dries up, and ere long becomes broken. By the time this green tender end of the twig is consumed the worm has acquired sufficient size and strength to attack the more solid woody portion forming its lower end. He accordingly eats his way downward in the centre of the twig, consuming the pith, to its base, and onward into the main limb from which this twig grows, extending his burrow obliquely downward to the center of the limb, to a distance of half an inch or an inch below the point where the lateral twig is given off.

The worm being about half grown, is now ready to cut the limb asunder. But this is a most nice and critical operation, requiring much skill and calculation; for the limb must not break and fall whilst he is in the act of gnawing it apart, or he will be crushed by being at the point where it bends and tears asunder, or will fall from the cavity there when it breaks open and separates. To avoid such casualities, therefore, he must after severing it, have time to withdraw himself back into his hole in the limb and plug the opening behind him, before the limb breaks and falls. And this little creature accordingly appears to be so much of a philosopher as to understand the force of the winds and their action upon the limbs of the tree, so that he can bring them into his service. He accordingly severs the limb so far that it will remain in its position until a strong gust of wind strikes it, whereupon it will break off and fall.

But the most astonishing part of this feat remains to be noticed. The limb which he cuts off is sometimes only a foot in length and is, consequently quite light; sometimes ten feet long, loaded with leaves, and very heavy. A man by carefully inspecting the length of the limb, the size of its branches, and the amount of foliage growing upon them, could judge how far it should be severed to insure its being afterwards broken by the winds. But this worm is imprisoned in a dark cell only an inch or two long, in the interior of the limb. How is it possible for this creature, therefore, to know the length and weight of the limb, and how far it should be cut asunder? A man, moreover, on cutting a number of limbs of different lengths, so far that they will be broken by the winds, will find that he has often miscalculated, and that several of the limbs do not break off as he designed they should. This little worm, however, never makes a mistake of this kind. If the limb be short, it severs all the woody fibres, leaving it hanging only by the outer bark. If it be longer, a few of the woody fibres on its upper side are left uncut in addition to the bark. If it be very long and heavy, not more than three-fourths of the wood will be severed. The annexed figures represent the severed ends of limbs of different

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Ends of oak limbs as cut off by the Oak pruner—designed to show that where the limb is small it cuts it all off except the outer bark; when the limb is larger, it leaves a ring of wood on one side, in addition to the bark; and when very large it leaves a large piece of wood unsevered—showing also the hole out of which the worm comes.

sizes, the coarsely dotted parts of the two first indicating the ragged broken ends of the woody fibres, the remainder being the smooth surface cut by the worms, and the large black dot representing the perforation leading up the limb to where the worm lies. The first of these figures was taken from the limb already spoken of as ten feet in length, and here it will be noticed that a portion of the stouter wood towards the center of the limb was preserved, as though the worm had been aware that the weaker sappy fibres outside, next to the bark, could not be relied upon for sustaining a limb of this size, as they are where the limb is smaller. With such consumate skill and seemingly super-terrestrial intelligence does this philosophical little carpenter vary his proceedings to meet the circumstances of his situation in each particular case! But by tracing the next stage of his life we shall be able to see how it is that he probably performs these feats which appear so much beyond his sphere.

Having cut the limb asunder so far that he supposes it will break with the next wind which arises, the worm withdraws himself into his burrow, and that he may not be stunned and drop therefrom should the limb strike the earth with violence when it falls, he closes the opening behind him by inserting therein a wad formed of elastic fibres of wood. He now feeds at his leasure upon the pith of the main limb, hereby extending his burrow up this limb six or twelve inches or more, until he attains his full growth—quietly awaiting the fall of the limb, and his descent therein to the ground. It is quite probable that he does not always sever the limb sufficiently in the first instance, for it to break and fall. Having cut it so much as he deems prudent, he withdraws and commences feeding upon the pith of the limb above the place where it is partially severed, until a high wind occurs. If the limb is not hereby broken, as soon as the weather becomes calm he very probably returns and gnaws off an additional portion of the wood, repeating this act again and again, it may be, until a wind comes which accomplishes the desired result. And this serves to explain to us why it is that the worm severs the limbs at such an early period of his life. For the formidable undertaking of cutting asunder such an extent of hard woody substance, we should expect he would await till he was almost grown and had attained his full strength and vigor. But by entering upon this task when he is but half grown he has ample opportunity to watch the result, and to return and perfect the work if he discovers his first essay fails to accomplish the end he has in view.

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Thus the first part of the life of this worm is passed in a small twig branching off from the main limb. This is so slender and delicate that on being mined as it is by the worm and all its green outer end consumed, it dies and becomes so decayed and brittle that it is usually broken off when the limb falls, whereby it has escaped the notice of writers, hitherto. The remainder of his larva life is passed in the main limb, first cutting off this limb sufficiently for it to break with the force of the winds, and then excavating a burrow upwards in the center of the limb, both before and after it has fallen to the ground, feeding hereon until he has grown to his full size.

It is most frequently the limbs of the red and the black oak that I have met with, severed by the Oak pruner, though it is not rare to find those of the scarlet oak (*Q. coccinea*) and of the white oak lopped off in the same manner. Limbs of the beech and chestnut not unfrequently, and those of the birch, the apple, and probably of other trees, are sometimes similarly severed. Mr. P. Weter, of Tirade, Walworth county, Wisconsin, informs me that the peach in his vicinity, suffers in a similar manner, and to such an extent some years, that the severed limbs, varying from a few inches to two feet in length, are seen lying under almost every tree. We have in our country several species of beetles very closely related to the Oak pruner, but no attempts have yet been made to ascertain their mode of life. It is very probable that they all have this same habit of cutting off the limbs of trees, one perhaps preferring the wood of one kind of tree, another, another. This is the more probable, since there is considerable diversity in their operations, as shown by an examination of the fallen limbs. Thus the scarlet oak, instead of having a hole bored in the severed end of its limbs, commonly has half the wood ate away on one side of the limb for the length of an inch or more, with the cavity thus formed under the bark packed with worm dust, and a cylindrical burrow from the upper end of this cavity running upwards in the centre of the limb, the same as in other cases.

It further appears that the female, when ready to drop an egg, is not always able to find a small twig with a green succulent end adapted to her wants. She then consigns her progeny to the bark of the main limb, and the young worm subsists on the soft pulpy matter between the bark and the wood, excavating a shallow irregular cavity which is packed with worm dust, till it has acquired sufficient strength to gnaw the wood, when it cuts off the limb as in other cases. It may, however, be a different species from the common Oak pruner, which cradles its young thus beneath the bark instead of in a lateral twig. It is usually in the fallen limbs of the beech, though sometimes in those of the oaks also, that I have met with these worm tracks under the bark.

The bark of the beech, it will be recollected, is quite thin and very brittle, so that it will illy serve to hold the limb in its place if the wood underneath is cut off in the usual manner. And accordingly a remarkable modification of this operation will be noticed in the amputated limbs of this tree. The worm eats its way down the limb beneath the bark until

it has acquired sufficient strength to sever the woody fibres. It then passes transversely around the limb beneath the bark, girdling it by cutting off all the softer outer fibers and leaving the harder ones in the middle of the limb uncut, whereby the limb is sustained until the wind strikes it. How surprising that these little creatures have such intelligence given them as enables them to vary their operations to such an extent, according to the circumstances of their situation in each particular case! I should be inclined to think the beech pruner a different species from that of the oak, as it dwells beneath the bark instead of in a lateral twig, and cuts off the outer instead of the inner wood of the limb; but the worm is identical with that of the oak in its external appearance, and one of these worms which I placed in a cage, falling from its fractured burrow in the beech limb, forsook this wood and commenced boring into an oak limb lying beside it.

Not only the limbs but small young trees, at least of the white oak, are sometimes felled by these insects; in which cases the worm, instead of cutting the wood off transversely, severs it in a slanting or oblique direction, as though it were aware the winds would prostrate a perpendicular shoot more readily by its being cut in this manner.

The LARVA grows to a length of 0.60, and is then 0.15 thick across its neck, where it is broadest. It tapers slightly from its neck backwards, the hind part of its body being nearly cylindrical. Is is a soft or fleshy grub, somewhat shining and of a white color, often slightly tinged with yellow, its head, which is small and retracted into the neck, being black in front. It is divided into twelve rings by very deep, wide, transverse grooves. The neck or first ring is much the largest, and shows two very pale tawny yellow bands on its upper side, the anterior one slightly broken asunder in its middle, and on each side beyond the ends of these bands is a spot of the same color. The two or three rings next to the neck are shorter than the others, and less widely separated from each other. A faint stripe of a darker color may be discerned along the middle of the back, widely broken apart at each of the sutures. The last ring is much narrower and more shining than the others, and is cut across by a fine transverse line, dividing it into two parts, of which the hinder one or tip is bearded with small blackish hairs, and a few fine hairs are perceptible upon the other rings. The two last rings are retracted into the ring which precedes them, at the pleasure of the animal, whereby this ring becomes humped and swollen; and it appears to be chiefly by thus enlarging the end of its body that the worm holds and moves itself about in its cell, its feet being so weak and minute that they are scarcely perceptible and can be of little service. It has three pairs of soft conical jointed feet, resembling its antennæ in their size and shape. The first pair is placed on an elevated wrinkle of the skin in the suture between the first and second segments of the thorax, more distant from each other than are those of the second and third pairs, which are situated on the middle of the elevation of the second and third segments.

Some of the worms enter their pupa state the last of autumn, and others not till the following spring. Hence in examining the fallen limbs in the winter, a larva may be found in one, a pupa in another. Preparatory to entering its pupa state, the larva places a small wad of woody fibres, sometimes intermingled with worm-dust, below it, in its burrow, and sometimes another wad above it if the burrow runs far up the limb, thus partitioning off a room one or two inches in length in which to lie during its pupa state. The shrivelled cast skin of the larva will be found at the upper end of this cell, after it has changed to a pupa.

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Usually those insects which undergo a complete metamorphosis, remain at rest, lying dormant and motionless during their pupa state. The Oak pruner, however, is a remarkable exception to this. Whenever its cell is opened it will be seen moving from one end of it to the other with quite as much agility as it shows in its larva state. The sutures of its abdomen have the same deep transverse grooves as in the larvæ, admitting the same amount of motion to this part of its body that it previously had. And lying on its back, it uses the tip of its abdomen as though it were furnished with a pro-leg, the little sharp points with which it is covered being pressed against the rough walls of the cell, and the body pushed forward or drawn backward hereby, step after step, at the will of the animal.

The PUPA is of much the same size with the larva and of a yellowish white color. Its eyes are sometimes white, sometimes blackish brown. The antennæ-sheaths arise in the notch upon the inner side of the eyes and passing directly across the surface of these organs, extend down along each side of the back above the sheaths of the fore and middle pairs of legs, then curving inward they pass back to the eye along the inner side of the same legs, their ends being placed upon the eye slightly inside of their origin. The knees of the hind legs protrude far out from under the upper sides of the wing-sheaths forward of their tips, whilst the feet of these legs occupy the space between the tips of the wing-sheaths. The back of the abdomen shows a distinct pale brown stripe along the middle, on each side of which the surface of the segments is furnished with numerous small erect sharp points of a dark brown color, those on the apical segment being double the length of the others.

Prof. Peck bestowed upon this insect the name *Stenocorus putator*, the latter epithet meaning a pruner or vine-dresser, and he characterizes the beetle thus named, as varying in length from 0.45 to 0.60, the largest individuals being but 0.12 in thickness, and being of a dull or obscure brown color with white hairs, its thorax without spines, its wing-covers two-toothed at their tips, and its antennæ of the length of the body, the two joints next to the base with a small spine at their tips. Dr. Harris adds to this that the surface is sprinkled with gray spots composed of very short close hairs and the scutel is yellowish white. These characters, however, will include what at present stand in the books as several distinct species. I would therefore observe that the specimens which I have obtained from the severed oak limbs of this vicinity and which I therefore regard with confidence as being the true *putator* of Prof. Peck, present the following characters. They are usually from 0.50 to 0.55 in length and 0.12 broad, of a slender cylindrical form, of a dull black color, tinged more or less with brown on the wing covers, more evidently so towards their tips, whilst the antennæ are paler brown, and the under side and legs chestnut colored, sometimes bright, sometimes dark and blackish. The surface is everywhere clothed with shortish prostrate gray hairs, and on the wing-covers these are in places more dense, forming small gray spots, and on each side of the thorax, in the middle, is a whitish dot, formed in the same manner. Sometimes also on the base of the thorax, on each side of its middle, a short gray stripe formed by these hairs, is very obvious, whilst in other individuals no traces of these stripes can be discerned.

The scutel also is densely covered and gray from these hairs. The surface, above, is occupied by numerous coarse round punctures, those on the thorax being of the same size with those on the wing-covers, but more crowded, many of them running into each other. Towards the tips of the wing-covers these punctures become perceptibly smaller. Among the punctures of the thorax, slightly back of its center, a smooth shining callous-like spot or short line may be discerned; and sometimes, forward of this, on each side of the middle a small dot, smooth and shining, is very distinct, such specimens appearing to constitute the species named *rusticum* by Dr. Le Conte. In some specimens, also, on the wing covers, sometimes one, more often two, slightly elevated, smooth longitudinal lines are very manifest, these appearing to be the *oblitum* of the same author. What I regard as the females of this species, although as yet I have bred no specimens of this kind from oak limbs, differ from the preceding in being of a slightly broader and more robust aspect, with the back more flattened, and the wing covers of a lighter brown color, and sometimes as pale as the antennæ. And in these no smooth callous-like spot back of the center of the thorax is to be perceived, in the few specimens which I at present have in my hands.

Although Prof. Peck and Dr. Harris regard this insect as different from any thing described by Fabricius, our latest authorities place it as a synonym of the *Stenocorus villosus* of this author. There, however, is nothing in the original description of the species thus named, to indicate it as being this more than any one of a half dozen other insects of our country. The *villosus* is merely said to be a slender medium-sized Carolina species of a dull or dusky color, slightly clad with ash-gray down, its thorax unarmed and its wing covers two-toothed. We find nothing in this description whereby it can be decided to which particular one of several species it refers. And if the name *villosus* ought not to be wholly rejected in consequence of this uncertainty, I am disposed to regard it as belonging to a southern species, the same, I suppose, which Dr. Le Conte places under this name, which is larger in size, and with the punctures of its thorax much more fine dense and confused than in our Oak pruner.

This insect is co-generic with a West India species named by Fabricius *Stenocorus irroratus*, for specimens of which and many other interesting species from the same locality, I am indebted to F. J. Barnard, Esq., of Albany. In the year 1833 M. Serville proposed a new genus, named *Elaphidion* (Ann. Soc. Ent. France, ii., 540) for the reception of this species. From the remarks of Rev. F. W. Hope in Trans. London Zool. Soc., iii., 187, it might be inferred that a genus named *Cyclioplеurus*, founded by him upon this same West India species, had been published in the Proceedings of said Society, May, 1833, a few months anterior to Serville. But though an abstract of Mr. Hope's paper was given in the place referred to, this genus is not noticed therein, and did not appear in print till the first volume of the Transactions of the Society was published, two

years later. *Elaphidion*, therefore, appears to be the legitimate name of the genus to which our Oak pruner pertains.

In at least three-fourths of the fallen limbs no worm is to be found; and an examination of them shows that the insect perished at the time the limb was severed, and before it had excavated any burrow upward in its center, no perforation being present except that leading into the lateral twig. It is probable that in many of these instances the limb broke when the worm was in the act of gnawing it asunder, either from its own weight or from a wind arising whilst the work was in progress. And even though the worm may have withdrawn into its hole and plugged the opening behind it, it is frequently discovered here, probably, and devoured by birds. After a violent wind in the summer season, some of our insect-eating birds may always be noticed actively in search of limbs and trees that have thereby been broken, their instinct teaching them that this breakage usually occurs from the wood being weakened by the mining operations of worms therein, whose lurking places are now opened to them. And they will be seen industriously occupied in picking around the fractured ends of the wood, and feasting upon the grubs which they there find. Numbers of our wood-boring larvæ are thus destroyed, and the Oak pruner, notwithstanding the precautions it takes to secrete itself, doubtless frequently falls a prey to these sagacious foragers.

These insects will undoubtedly at times occur in such numbers as to render it important that they be destroyed, at least where they resort to the peach or other valuable trees. And this may readily be effected by gathering and burning the fallen limbs in the winter or the early part of spring.

The SINGLE STRIPED TREE HOPPER, No. 102, is common upon oak limbs, puncturing them and sucking their juices.

306. OAK BLIGHT, *Eriosoma Querci*, new species. (Homoptera. Aphidæ.)

A species of blight, or a wooly aphis upon oak limbs, puncturing them and exhausting them of their sap, was met with in northern Illinois, but I have never seen it in New York. It is very like a similar insect upon the bass-wood. The winged individuals are black throughout, and slightly dusted over with an ash-gray powder resembling mold. The fore wings are clear and glassy, with their stigma-spot dusky and feebly transparent, their rib-vein black, and their third oblique vein abortive nearly or quite to the fork. It is 0.16 long to the tips of its wings. I find no wooly aphis mentioned by European authors as infesting the oak, except the *Eriosoma Quercus* of Sir Oswald Mosley (Gardener's Chronicle, i. 828), which, in the List of Homopterous insects of the British Museum, p. 1083, is supposed to be the *Coccus lanatus* of Geoffroy, and would hence appear to be a very different insect from the one now described.

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307. WHITE OAK SCALE INSECT, *Lecanium Quercifex*, new species. (Homoptera. Coccidæ.)

Adhering to the smooth bark on the under side of the limbs of the white oak, in June, an oval, convex, brownish black scale about 0.30 long and 0.18 wide, its margin paler and dull yellowish, from which come myriads of lice so minute as to be scarcely perceptible to the eye, and which distribute themselves over the surrounding bark, sucking its juices.

I am unable to refer to any description of the European scale insect of the oak, *L. Quercus*, Linn., but as Geoffroy terms that species the Kidney-shaped oak scale (*Quercus reniformis*) I am led to conclude it is different from the regularly rounded-oval scale of the oaks in this country.

308. QUERCITRON OAK SCALE INSECT, *Lecanium Quercitronis*, new species.

On the small limbs of the black oak, a similar scale to the preceding, but smaller and of a nearly hemispherical form, its color varying from brownish black to dull reddish and pale dull yellow, with a more or less distinct stripe of paler yellow along the middle of its back, and the paler individuals usually mottled with black spots or stripes. Length of the larger scales about 0.20, width 0.16.

These scales, the reader will be aware, are the relics of the female, covering and protecting her eggs. Interspersed with them are usually seen other scales and smaller, only 0.10 in length, and of an elliptic form and a glossy black color with a wide margin of pale yellow, which margin has a plaited appearance from fine raised radiating lines. These smaller scales are the pupæ of the males, a small winged fly coming from each of them, whereas the females never acquire wings.

Often a round hole will be noticed in these smaller scales, perforating them near one end. This hole is gnawed by a minute parasite, which has fed internally on the insect and completed its transformations beneath the scale. Of five of these pupæ scales which were gathered on the first day of June, one was found to be already perforated. From another the parasite came out five days afterwards, and a second specimen made its exit from another of the scales five days later. This same parasite also destroys the male pupæ of some of the other species of this genus. It pertains to the family PROCTOTRUPIDÆ, and appears to belong to the genus *Platygaster*. It may be named *P. Lecanii*, or the Scale insect parasite. It is quite small, measuring 0.035, and to the tip of its wings 0.05. It is shining black, with its scutel pale yellow and appearing like a large crescent-shaped spot of this color placed crosswise upon the hind part of its thorax. Its legs are white with the thighs black except at their opposite ends. Its abdomen is slightly smaller than the thorax and shaped like the bowl of a spoon, being deeply hollowed on the back and convex beneath. Its antennæ are thread-like with the joints cylindrical and three times as long as thick, the last one not enlarged. Its wings are clear and glassy, strongly reflecting the colors of the rainbow. They are wholly destitute of veins, except a rib-vein running parallel with the outer margin the

first half of its length and then uniting with the margin to beyond the middle, where it is slightly incurved and ends in an irregular triangular knob.

309. OAK-TUMOR GALL-FLY, *Cynips Quercus-tuber*, new species. (Hymenoptera. Cynipidæ.)

On or near the ends of the small limbs and twigs of the white oak, hard irregular swellings thrice as thick as the twig below them, the bark upon them of a brighter cherry red color than elsewhere, and their substance internally corky and woody; produced by the stings of a small black gall-fly with dull pale yellow antennæ, mouth and legs, its hind shanks and its antennæ towards their tips being dusky, its length 0.08 and to the tips of its wings 0.13.

These tumors or galls are quite common, particularly upon the soft and tender limbs of small young trees. Two distinct varieties in their form will be observed as they grow at the ends of the limbs, or lower down upon their sides. Those upon or near the tips of the limbs are shorter *rounded galls*, little longer than broad, and usually of a deeper red color and a more irregular uneven surface. They are about a half inch in length and a fourth less in thickness. Those growing along the side of the stem are longer *elliptic galls* of about the same width as the preceding, but twice or three times as long, and of a paler though still a deep cherry red color. The whole circumference of the limb is involved in this diseased swelling, except a narrow stripe along its hind side where the bark retains its natural striated appearance. When fully grown the surface of both kinds of these galls becomes glaucous white, as though thinly coated with moldiness. Sometimes two, three or more of these tumors occur on the same limb, placed irregularly one below the other, or running partially into each other. A single one, however, always suffices to kill the limb at and above the point where it is situated, thus arresting its onward growth until one of the lateral shoots below grows to become a leading shoot in place of the one thus destroyed.

On cutting into these galls the small limb on which they grow is found to have its wood thickened or swollen, and over it, forming the chief bulk of the tumor, is a corky substance of a yellowish brown or snuff color, between which and the wood are several small hard grains resembling seeds, each having a cavity in its center, in which, doubled together, lies a soft white footless worm or maggot. This, on completing its growth, changes to a pupa in the same cell, and subsequently to a fly like its parent above described; whereupon, to escape from its confinement, it gnaws out of this hard seed-like envelope and onward through the corky substance and the external bark, thus producing those small perforations like pin-holes, which are always seen in these tumors after the insects have made their exit therefrom.

As several kinds of galls and gall insects are to be noticed in this part

of my Report, some general remarks respecting them should here be introduced for popular information.

The term "gall" is currently understood, and is quite common as a proverbial word in our community, as implying a substance of an extremely bitter taste; and this originally was the true and sole signification of this word. Several of these vegetable excrescences being intensely bitter, they hence came to be called galls and gall-nuts. And thus this term was extended to other similar substances, though destitute of this property, and has now in different languages become the technical designation for all kinds of vegetable swellings, excrescences, and other unnatural growths which are produced by the stings of insects, whether they possess any bitterness or not. Even the knot-like swellings which are formed in the stalks of wheat by the Hessian fly and the Joint worm are true galls in the modern sense of this term. And the insects producing such swellings are called gall-flies. Nearly all of these insects pertain to two families, those which have four wings, like the one now under consideration, constituting the *Cynips* family in the order HYMENOPTERA, and those with two wings forming the *Cecidomyia* group in the order DIPTERA. But as the insects of these two groups have no resemblance to each other, and correspond only in the one particular of producing excrescences by their stings, the latter are more correctly and definitely termed gall-midges, and it is the members of the *Cynips* family only to which the name gall-flies truly belongs.

From differences in their form and in the number of joints in their antennæ, the gall-flies are divided into several genera. Of these genera that which retains the name *Cynips* is much the most numerous in its species. They are mostly very small insects resembling bees or ants of a short thick form, but with their antennæ straight instead of elbowed, and with none of that activity in their movements which belong to the insects named. They are mostly of a coal black color, with pale legs and antennæ, several of the species differing from each other only very slightly in size and in the hue of some particular part, being known with more certainty from the different galls from which they come than from the characters which the flies themselves present. In the several species here noticed, and ranked in the genus *Cynips*, five small longitudinal furrows may be seen on the thorax. Their scutel is rounded and protuberant, with a rough granular surface. Their abdomen is highly polished and shining, in the females compressed and shaped like a lens, its outline being nearly round when viewed in profile, with its hind end usually more or less truncated or cut off in a straight line perpendicularly, with a projecting valve at its lower end, and above this the end of the sting protruding obliquely upward. It is equal in its size to the thorax, but is smaller in the males, and without the projecting sting. The wings are transparent and colorless, the forward pair with three longitudinal veins and two transverse or oblique veinlets. The inner and middle longitudinal veins are abortive, being marked merely by very fine colorless lines, scarcely perceptible in the smaller species, and in strong contrast with the other vein and the veinlets, which are coarse,

often dark colored, and very distinct. The middle longitudinal vein arises from the middle of the anterior veinlet, but is often obliterated at its commencement. It is widely forked, slightly before it reaches the second veinlet sending off a straight and very coarse branch to the outer margin. By the inner end of the second veinlet crossing this fork slightly back of its commencement a small triangular cell is formed in the center of the wing. Westwood, in defining this genus, says this small cell is bounded by veins of equal thickness ; but in all the American gall-flies known to me the veins on one or both the anterior sides of this cell are much more slender than the one on its posterior side. Finally, the antennæ are thread-like, or of the same thickness through their entire length, and are about half the length of the body. Their joints are separated by very slight constrictions, whereby they are counted with difficulty by the aid of a common magnifying glass ; but this instrument is sufficient to show their number, even in the smaller species. Westwood states the number of joints to be fourteen in the females and one more in the males. Hartig differs with him as to the latter. Brulle (Hymenopt. iv. 635) merely cites these authors without affirming anything on this subject himself. Had he no specimens at hand whereby to determine a point which appears so simple ? Doubtless he had, and on examining them found he was unable to decide this matter. For, though the number of these joints appears to be constant in the same species, they differ in different species. Thus, in the gall-flies of the oak here described, of six species of which I possess examples of both the sexes, I find the number of joints to be as stated by Mr. Westwood in three only. In two of the others the females have but thirteen joints. Whilst in the remaining species, which is the Oak-tumor gall-fly now under consideration, the antennæ of the males have only fourteen and those of the females twelve joints. And in a seventh species, only the females of which are known to me, the number of these joints amounts to fifteen. It hence appears that the antennæ of these insects have sometimes one sometimes two more joints in the males than in the opposite sex, and that in the latter the number is from twelve to fifteen in different species.

In all parts of the world the oaks are far more infested with gall-flies than trees of any other kind. The naturalist Bosc during his residence in Carolina observed sixteen different kinds of galls, of which eight grew upon oaks; but all his endeavors to rear the flies from them were futile. My own efforts have been more successful, as will be seen by the accompanying notices. And a number of oak-galls, in addition to those herewith presented, are known to me, from which I have not yet been able to obtain the flies, from some of them parasites having come in their stead. I regret that I am unable to refer to the memoir of Bosc on the insects of this family, long since published in the second volume of the Paris Journal of Natural History, and also the Monograph of Brischke, which appeared a few years since at Berlin. Hence I may perchance here be giving as new, some species which have already been named in this latter work.

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Linnæus, in this group of insects, set us the example of bestowing names which express not merely the kind of tree but the particular part thereof, or the appearance of the gall from which the respective species are produced (*Cynips Quercus baccarum*, Oak berry gall-fly, *C. Quercus ramuli*, Oak twigs, *etc.*), and though such compound names are to be avoided as being inconveniently long, a departure from the general rule may well be permitted in this family, since hereby the names alone, in most instances, definitely indicate the species to which they refer, and these names also serve to diversify and relieve the science somewhat from that wearisome sameness and uniformity which pervades its nomenclature.

Where any of these insects attack a valued tree which it is desired to preserve from their depredations, the remedy is obvious and simple. Before the galls which they produce are so far matured that the inclosed insects have perforated and escaped from them, they should be cut from the tree and burned. Fortunately, it is only small young trees that gall-flies are liable to destroy or greatly injure by their attacks. And their parasitic and other enemies restrain them from multiplying so that it is seldom they will require any interference from man.

310. OAK-TREE GALL-FLY, *Cynips Quercus-arbos*, new species.

Swellings similar to those above described, growing on the tips of the limbs of aged and large white oak trees; producing a small black gall-fly having all its legs and antennæ of a bright pale yellow color, and one more joint in the latter organs than in the preceding species in the males, which sex is 0.06 in length, and to the tips of its wings 0.10.

I have in repeated instances observed these swellings at the tips of the lofty limbs of mature and aged oaks, when the trees were felled and their limbs thus brought within view. But having until this moment supposed these galls the same with the preceding species, I have taken no care to obtain the flies from them.

The fact has heretofore been stated that where trees are standing apart, for furnishing a shade in pastures and other cleared lands, or as ornamental trees in parks and pleasure-grounds, they gather more insects and are hence more stinted and deformed in their growth, than when they are associated together in forests. A large solitary oak which formerly stood in prominent view from the door of my dwelling was noticed for many years as making no perceptible advance in height or in the size of its body and limbs, although apparently healthy and clothed luxuriantly each summer with foliage. One morning in March this tree was observed cut down, and on repairing to it, it was discovered that the extreme ends of all the more vigorous and thrifty limbs and twigs were swollen into knobs or galls, wherefrom these ends would perish and their onward growth be thus arrested, all the other more puny limbs showing on their ends dead and decaying knobs of the same kind, which had grown in preceding years. Thus it was evidently this small gall-fly, which, by killing the ends of all the most vigorous and thrifty shoots, year after year, had been retarding

the further growth of this majestic tree. The galls were at that time perforated with pin-holes, showing that the fly had come from them the preceding autumn. On a careful search, however, two were found with the insect still in them. These were placed in a glass jar, and a single male fly was obtained from them, which I now discover to be unlike the foregoing species. I hence infer this to infest mature and aged trees, whilst all my specimens of that were reared from the more accessible galls growing on the tender juicy branches of young shoots and saplings.

311. OAK-POTATO GALL-FLY, *Cynips Quercus-batatus*, new species.

A large, hard, uneven swelling, three-fourths of an inch thick and twice or thrice as long, resembling a potato in its shape, growing on white oak twigs more distant from their ends than the Oak-tumor; producing a small black gall-fly with the basal joints of its antennæ and its legs dull pale yellow, its thighs and hind shanks black and its middle shanks often dusky, the antennæ in the female with thirteen joints, and the length of this sex 0.09.

This gall might be mistaken for a large example of the Elliptic variety of the one first described, but at each end the swelling arises much more abruptly from the limb, and on all sides of it, whereby the limb is wholly obliterated. Its surface is coated with a glaucous pale blue bloom. Internally it is of a dense corky texture in which are hard woody spots. And the fly which comes from it is readily distinguished from the Oak-tumor fly by the black color of its thighs.

312, 313. OAK-BULLET GALL-FLIES. *Callaspidia Quercus-globulus*, new species, and *Cynips oneratus*, Harris.

Smooth globular galls the size of a bullet, growing singly or two, three or more in a cluster, upon white oak twigs, internally of a corky texture, each containing in its center a single worm lying in a oval whitish shell resembling a little egg 0.15 in length; producing sometimes a black gall-fly with tawny-red legs and the second veinlet of its wings elbowed or augularly bent backwards, its length 0.15; sometimes a smaller fly (*C. oneratus*) of a clean pale yellow color, almost white, with a broad black stripe the whole length of its back, which color in the males is more extended, reaching down upon the sides, its length 0.12.

Although Dr. Harris regards these two flies as varieties of one species, they certainly are very distinct, differing in size, clothing, color and structure, insomuch that they pertain to two different genera. The first is bearded over with fine short gray hairs, whilst the other is smooth. Its sting is also evenly bearded with longer coarser hairs, which are wanting in the other. The second veinlet of its wings is bent nearly to a right angle, whilst in the other it is straight. The antennæ have the same number of joints (15 and 14) in the sexes of both, but in the one fly they are black, in the other pale yellow, and with the joints evidently shorter. And

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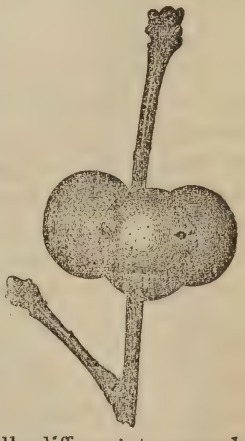
I cannot but think that further researches will show that the galls from which they come grow upon different parts of the white oak, if those of both flies really be produced by this one tree; and that the galls themselves will present some differences in their structure. My specimens of the smaller brighter colored fly were found in a jar in which had been placed quite a number of galls, and which had produced an equal number of the larger flies, and several parasites, whereby it was impossible to ascertain the particular galls from which they respectively came.

I retain the name of Dr. Harris for the species of which he gives an independent description, and which he says comes out in June and July; and present a new name for his dark colored variety, specimens of which I have captured on the wing early in May, and again in September, and which thus appears to be two-brooded, whilst of the other there is probably but one generation annually.

The species which I present as new, is subject to considerable variety in its colors. A broad tawny red ring usually surrounds its eyes, and on each side of its thorax is one or more spots of the same color. Sometimes the scutel is also red, and the under side and tip of the abdomen is frequently of a resin-like red color, instead of black. Its wing veins are black and the second transverse veinlet is margined with smoky along its hind side. This veinlet is angularly bent not only at half the distance from its outer end to the small central cell, but also a second time, where it forms the hind boundary of this cell, and hereby the cell, instead of its usual triangular form, has the shape of a spear head in this species. Its size, its aspect, and some other characters are similar to the Oak-apple and Cloudy-winged gall-flies, under which latter species, § 318, its generic relationship will be more particularly stated.



These bullet-like galls are most common and oftenest noticed of any of the galls on our oaks. When growing they are of a pale greenish color, shaded into bright red upon the side which is most exposed to the light, and with the fading of the leaves in autumn, they also fade to the same pale dull yellow hue with the dead leaves, even though the insect be still inclosed in them, to pass the winter, as it sometimes is.

I have obtained two parasites from these galls. They probably destroy both kinds of these flies indifferently, and also the flies of other galls; for the parasites of these gall insects are not limited, each to a particular species, as we know from frequently obtaining the same parasite from the galls of totally different trees and shrubs. These parasites pertain to the family CHALCIDIDÆ, and resemble gall-flies in their general appearance, but are at once distinguished from the latter group of insects by the absence of veins in their wings. In

addition to the galls from which they are bred, only a brief description will be required to enable one to recognize them.

The Oak-ball parasite, *Macroglenes Querci-globuli*, new species.

This much resembles the gall-fly from which it is named, in its size and general appearance. It is black, with the basal joint of the antennæ and the legs dull white, the thighs pale dull yellow, and the abdomen tinged with this last color along its under side. Length 0.15.

The Oak-bullet parasite, *Pteromalus onerati*, new species.

This is smaller and more beautifully colored than the preceding, being of a brilliant coppery hue with a green reflection, and the under side of its abdomen golden yellow. Its legs are sulphur yellow and its antennæ dark brown with the first joint pale yellowish. It is 0.10 in length, with the females somewhat larger. I have also obtained this species from one of the galls of willow twigs.

314. Oak-fig gall-fly, *Cynips Quercus-ficus*, new species.

Surrounding the twigs of white oaks in a dense cluster, resembling preserved figs packed in boxes, each molded to the shape of those pressing against its sides, hollow bladder-like galls of the pale dull yellow color of a faded oak leaf, each gall producing a small black fly with the lower half of its head, its antennæ and legs pale dull yellow, its hind shanks dusky and its abdomen beneath reddish-brown, its antennæ with fifteen and in the female thirteen joints. Length 0.06, females 0.10, and to the end of their wings 0.14.

These galls are common upon the long slender shoots of young and thriftily growing white oaks. No comparison occurs to me which will give so correct an idea of their appearance, as that of preserved figs, as we see them packed in boxes, each conforming to the shape of those surrounding and pressing against it on every side, and their outer surface showing irregular rounded elevations with intervening hollows and fissures, resembling the convolutions of the brain or of the intestines. These masses of galls sometimes form a roundish ball, a half or three-fourths of an inch in diameter, with the twig passing through its center. But more frequently they extend along the twig three, six or more inches, in an uneven knobby mass.

It is interesting to notice the first commencement and subsequent growth of these galls, which is as follows: The female pierces the bark with her sting and inserts a number of eggs at short distances from each other, sinking them

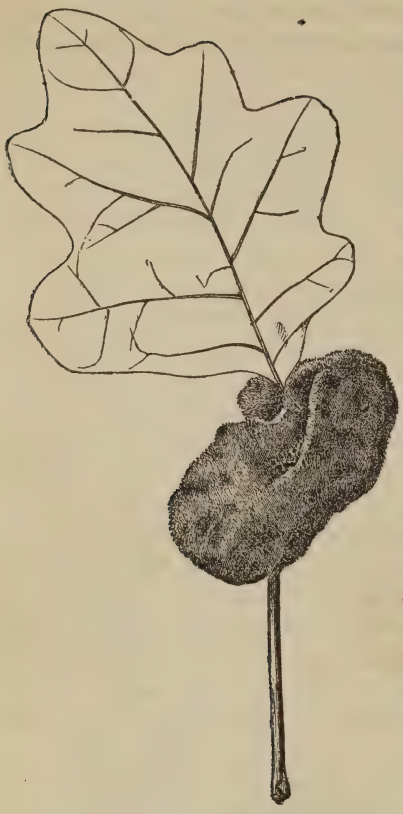
into the wood beneath the bark, it would appear, for a little discolored spongy spot runs inward from each gall to the pith of the limb. The wounds of the bark from these punctures become so entirely healed that no indications of them can be detected with a magnifying glass. But a little smooth round swelling or elevation of the bark soon commences above each egg, which swelling increases, until at length the bark bursts and a small round granule, the size of a pin's head, protrudes from the opening. These grow more and more, resembling a cluster of grapes when they have attained half their size and are beginning to crowd one against another. They finally attain from a quarter to a half inch in diameter. Their outer surface is covered with fine short hairs, which become rubbed off from their more exposed parts. The worm lies in a small oval cavity at the base of each gall, the walls of this cavity being whitish, tough and leathery, resembling a small seed, from the outer surface of which numerous crinkled, brittle, wooly fibers of a rusty yellow color radiate to the outer envelope of the gall, which is a thin paper-like membrane, soft and flexible when moist but brittle and breaking from a slight pressure when dried. Most of these galls are found perforated in the winter season, when they and all other excresences are more particularly noticed, the fall of the leaves then exposing them to view; but particular clusters will at that season be discovered with the insects still remaining in them, to come forth the following June. There hence appears to be two broods of this fly annually, one having come from the perforated galls the preceding summer, whose eggs have produced the unperforated galls in which the insects repose during the winter.

The fly from these galls is very similar to that of the Oak tumor, differing from that species only in being slightly larger, with its abdomen paler beneath, and in having more joints in its antennæ.

315. Wool-sower gall-fly, *Cynips seminator*, Harris.

A round mass resembling wool, from the size of a walnut to that of a goose egg, growing on the side of or surrounding white oak twigs, in June of a pure white color or tinged or speckled with rose red, and in autumn the color of sponge; producing small shining black gall-flies with bright tawny yellow legs and antennæ and in the female the head and thorax cinnamon red; their antennæ of fifteen and fourteen joints, length 0.08 and the females 0.11.

These galls first show themselves on the thriftiest young succulent shoots in the month of June, and they then resemble a lock of fine soft wool of a pure white color or with a delicate rose red tinge upon one side, or sometimes they are clean white with numerous elevated points of deep rose red, and are then truly beautiful in their appearance. From these galls I have obtained the flies the fore part of July. These flies immediately sow their eggs for another crop, and the oak twigs having now become harder and more woody, the galls growing on them are of a coarser



texture and duller color, resembling a ball of sponge rather than wool. These remain through the winter, though their attachment to the twig is so slight that birds picking into them, they are often torn off and fall to the ground. Internally, adjoining the twig, they consist of a mass of white hard grains resembling seeds, each of which yields a fly.

The two sexes differ remarkably in their colors, the head and thorax being black in the male, with the mouth only cinnamon red, whilst in the female the whole of these parts is of this color, the abdomen only being black. It is the male only which is described by Dr. Harris, and a person with specimens of the female in his hands would not suspect them to be the species of which he treats. The female is much the most common. A single gall gave me forty specimens of this sex and only one male.

AFFECTING THE LEAVES.

316. Oak-wool gall-fly, *Cynips Quercus-lana*, new species.

A round mass resembling wool, the size of a hazelnut or walnut, and of a white or buff color, growing upon one of the principal veins on the under side of white oak leaves, and producing several small black flies with white or straw colored heads, antennæ and legs, and with shining smoky yellow abdomens, having a black or blackish cloud occupying their back and sides, the females with fifteen-jointed antennæ, and their length 0.09.

It is not a little curious that two insects so nearly identical as the Oak-tumor and the Oak-fig gall-flies, should produce galls which are totally dissimilar—the one being merely a smooth swelling of the bark, the other a mass of semi-collapsed bladders the size of acorns crowded together around the limb—whilst here, on the other hand, we have two insects which have little resemblance to each other, yet producing galls which can scarcely be distinguished the one from the other. No one noticing on our white oaks these little round bunches of buff colored wool in which the young of the Wool-sower and of the Oak-wool gall-flies are cradled, growing perhaps but a few inches apart, one on a leaf the other on a twig, would suspect

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anything else than that both were the same thing, produced very probably by a single insect puncturing and inserting a part of its eggs in the vein of

the leaf and then moving a short distance aside and bestowing the remainder on the adjacent twig—dividing them thus, as do many other insects, to increase the chances for a portion of its young to escape destruction should any casualty befall them in the one or the other place. And if a person were curious to know the kind of insect which with such maternal care had formed these velvety little beds for the secure and comfortable repose of its young, he would scarcely deem it worth his while to gather but one of the two bunches; though to make the research more certain of a successful issue he might perchance secure them both. And on placing them in a covered tumbler and moistening them occasionally, till after a time a multitude of little black flies made their appearance in the glass, what would be his astonishment to find there were four different kinds of insects there, when he had expected to see but one. The result would be a riddle, a perfect paradox to him, unless from being somewhat versed in the habits and aspects of this class of creatures, he would be able to discern that two of these kinds being gall makers must have come one from the one wad of wool and the other from the other—thus showing these two little tufts of wool to be in reality two distinct natural substances, although the only

perceptible difference between them is that one grows upon the leaves and the other upon the twigs. And the other flies in the glass being found of the parasitic kind, he would perceive they must have subsisted on and destroyed other individuals of these gall makers, and had thus come out of the galls in their stead. Thus, where he supposed he had simply one vegetable production from which a single kind of insect would come, he finds nature has actually formed two of the former and four of the latter. With such astonishing profusion and seeming superabundance is every little corner and recess in the domain of nature diversified and teeming with life.

Internally in these little masses of wool are numerous hard seeds about the size of grains of wheat, of a bright chestnut color, crowded together and attached by their lower ends to the vein of the leaf. In each of these is a worm, which, on completing its transformations, gnaws off the upper end of its cell, and eats directly outward through the wool and escapes from its confinement, hereby making the same pin-hole perforations in these soft wooly galls that are seen in the other harder kinds when the insects have evacuated them.

I have not succeeded in obtaining the males of this species, its galls having in all but one instance yielded me parasites only. This is the more remarkable, since, from the very similar galls of the wool-sower growing on the twigs, I have never obtained any insects of this kind. And it would hence appear that the one gall being firmly fixed whilst the other vibrates and swings with the leaf, nature has left the multiplication of the one to be checked by the birds, and they being unable to pick into the other, these parasitic destroyers have here been formed and commissioned to execute the same work.

Like most of the other parasites which infest this group, these pertain to the family CHALCIDIDÆ, belonging to the same order of insects with the gall-flies. They may be named and distinguished as follows:

The OAK-WOOL PARASITE, *Spalangia Querci-lanæ*, new species.

Black, with the face, antennæ, sides of the collar, and legs whitish or greenish-yellow. Length 0.08 to 0.10. Some individuals have the upper side of the hind thighs and of the first joint of the antennæ black. The abdomen is smooth and polished, its under side of a tawny red color, and it is separated from the thorax by a pedicel. The stigma of its fore wings is a semicircular black shining spot with a small appendage on the inner side of its hind end and its base slightly separated from the robust rib-vein, which vein is of a dark brown or black color. Its cubical head, which is about as long as wide, indicates its relationship to *Spalangia*, though in some other respects it does not appear to fully coincide with the characters assigned to this genus.

Specimens frequently occur, so very different in their colors that they might almost be deemed a distinct species. They may be termed the Line-backed variety (*dorsalis*) of the Oak-wool parasite. In them the thorax

is pale greenish yellow, with a black stripe along its middle, and the abdomen is yellow, with the back black, and commonly with black bands upon its sides.

The WOOL-TUFT PARASITE, *Eurytoma lanulæ*, new species.

This is black throughout, with only its feet white and their tips dusky, and the abdomen smooth and polished. It is 0.08 long. This is less common than the preceding, and is obtained as frequently from galls on willows, as from these wooly galls on oak leaves.

317. OAK-APPLE GALL-FLY, *Callaspidia confluenta*, Harris.

Large smooth globular galls resembling apples, growing on the larger veins on the under side of the leaves of the red oak, each gall producing a large black gall-fly with deep tawny red legs, and its wings with a smoky brown spot margining the second veinlet on its hind side, the female antennæ with thirteen joints, her length 0.25.

This is our largest kind of gall-fly. There are probably two generations of it annually, for early in June the galls are found upon the trees grown to their full size, which varies from an inch to an inch and three-quarters in diameter. Their attachment to the leaf is so slight and brittle that when the leaves are agitated with a strong wind numbers of them break off and fall, so that the ground under particular trees is copiously scattered with them, even when they are but half or two-thirds grown, the latter part of May. They then resemble large nice smooth gooseberries, being of a lively pale green color, freckled with large blackish or purplish brown dots, and clear and semi-transparent when held between the eye and the light, with an opake cloud-like spot in their center. Cut open, this central spot is seen to be a pale greenish yellow ball the size of a pea, with numerous white threads beautifully radiating from its surface to the outer wall, and holding this ball in its place in the otherwise vacant cavity. On cutting this ball asunder it is found to be very juicy and white internally, with a round cavity in its center, in which lies a small plump white maggot, curved into the shape of a crescent, and lying motionless and without any signs of life. The exterior wall is 0.05 thick, or about the thickness of the rind usually taken from an apple when it is peeled, and of a similar succulent juicy texture.

These green immature galls, so smooth, plump and semi-transparent, have a most tempting appearance, as though they were some fine juicy fruit, of which the taste will be delicious. But though so tender and succulent they are perfectly tasteless, neither the outer rind nor the central ball having any perceptible flavor. But their luscious aspect, in connection with their popular name of "Oak apples," excites the children in many neighborhoods all over our country, to gather and eat them, rejecting the central core containing the worm. They are probably inert and destitute of any effect when thus eaten. Certainly they are not deleteri-

ous. A school teacher who was recently employed in Michigan, in a school house which was surrounded with shrub oaks which were loaded with these galls, informs me that for many days the pupils at every recess were filling their pockets with them, and eating them almost incessantly, yet without ill effects therefrom in any instance.

318. CLOUDY-WINGED GALL-FLY, *Callaspidia nubilipennis*, Harris.

Galls like the preceding, but only the size of a hazelnut or grape, growing through the leafy expansion of the red oak, a third of the sphere projecting from the upper surface of the leaf and the remainder opposite on its under side; producing a large black gall-fly with tawny yellow legs and its wings smoky on their disk and tips, with none of the veins continued into the margin, the antennæ thirteen-jointed in the female, which is 0.20 long, and to the tips of her wings 0.30.

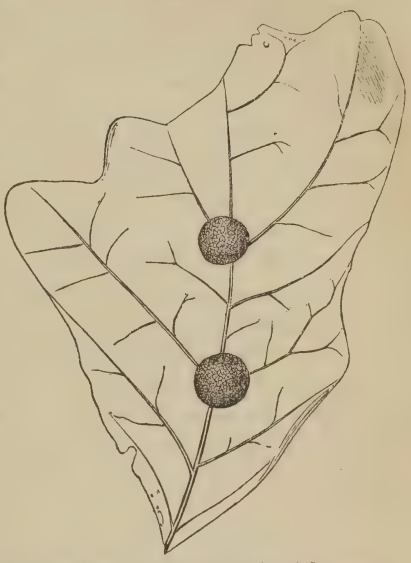
I met with this fly among fallen oak leaves early in April, where it might have been reposing through the winter; and from the brief, indefinite notice which Dr. Harris gives of it and its gall, I infer it to be from the gall above described, which I have only found after the fly had escaped. Galls perfectly the same, however, except that they show no vestiges of any attachment to a leaf, being smooth and even on every side, are sometimes found among fallen leaves, perforated, early in the spring.

This species and the Oak-apple gall-fly, having none of the wing veins prolonged into the margin, and the scutel obtuse and rough, will belong to Dalman's genus *Callaspidia*. But while the antennæ are thread-like in the Oak-apple gall-fly, they are slightly thicker towards their tips in the present species, and are also shorter, not reaching the base of the thorax. The second veinlet of the fore wings is curved like a bow in both these species, which appears to be a generic character of much value. And I do not hesitate in referring the Oak-bullet gall-fly (*C. Quercus-globulus*) to this genus also, notwithstanding the one additional joint in its antennæ, its aspect being so very like that of the Oak-apple gall-fly, as Dr. Harris has observed. Its size, its pubescence, its second veinlet edged with smoky along its hind side and angularly bent, show its greater affinity to these than to the species of the genus *Cynips*. And the outer longitudinal or subcostal vein does not fully reach the margin, although it is much less widely separated therefrom than in the two other species. On the whole, it should probably be regarded as forming the type of a new genus.

319. OAK-PEA GALL-FLY, *Cynips Quercus-pisum*, new species.

On a vein on the under side of white oak leaves, a globular gall resembling a pea, its surface finely netted with fissures or cracks and intervening elevated points like the surface of a strawberry, usually with two cavities in its center divided by a thin partition; producing a black gall-fly with legs, antennæ and the valve of the lower tip of its abdomen pale dull yellow or straw color, and also the face and mouth in the males, the antennæ

fifteen-jointed, in the females thirteen and dusky towards their tips. Length 0.08. female 0.11 and to the end of her wings 0.16.



These galls are not rare, and in the same situation a similar though somewhat smaller gall occurs, the surface of which is smooth; but from these I have not yet succeeded in obtaining the fly. When young the surface of these galls is rough, but not cracked into the net-work of lines that is afterwards seen. The interstices between these cracks are sometimes flat but oftener show an elevated point or pimple in their center. The galls are carried to the ground with the leaves when they fall in autumn, the insects remaining in them till the following spring. They are of a pale greenish yellow color tinged on one side with red, when growing, but fade in autumn to the same color as the dead leaves.

In addition to gall-flies the two following parasites come from these galls, hatching therefrom as early as the middle or latter part of April. The first of these is oftenest obtained, and what appears to be the same species comes also from galls upon whortleberry bushes.

The OAK-PEA PARASITE, *Macroglenes Querci-pisi*, new species.

Black, the feet white, the hind thighs black and their shanks black in the middle, the four anterior thighs black or brown in the middle and their shanks white but often in the middle brown, the eyes red. Length 0.10 to 0.13.

The OAK-PILL PARASITE, *Pteromalus Querci-pilulæ*, new species.

Brilliant green tinged with coppery, the legs light tawny yellow, their thighs brilliant green in front, black behind, the middle pair tawny yellow with a green-black stripe above and another beneath, the feet dull white with black tips, the abdomen with a fine gray beard, its conical tip purple black. Length 0.18.

The gall from which this parasite came had but a single cavity in its center, instead of the two usually found there; and I suspect that having consumed one of the larvæ of the gall-fly, it breaks through the thin partition dividing the cells, and then feeds upon the other, this amount of nourishment being apparently necessary to complete its growth to a size so much larger than that of the gall-fly and the other parasite which subsists upon it.

OAK. LEAVES.

320. CHINQUAPIN-OAK GALL-FLY, *Figites Chinquapin*, new species.

Arising perpendicularly or obliquely from the upper surface of the leaves of the Chinquapin oak (*Quercus Chinquapin*), like pins inserted therein, little slender club-shaped galls nearly a half inch long, formed of a pale green elliptic head like a minute pod, tapering into a slender dull brown stalk twice as long as the head, the surface thinly clothed with fine short hairs; producing a small black gall-fly with bright tawny yellow antennæ and legs, its length 0.10.

These singular little galls are met with in May, one or more growing upon the same leaf. The walls of the little pod at their summit are exceedingly thin and the fly comes out through a round hole which it gnaws near the upper end. It is remarkably large in comparison with the small delicate gall in which it is nurtured. Its antennæ in the female, the only sex known to me, are thirteen jointed, thicker towards their ends, and do not reach the base of the thorax. The second veinlet of its wings is angularly bent. Its scutel has a slight furrow in its middle; and the suture, on each side of its base, is widened into a small roundish excavation.

OAK SPANGLES, perfectly the same as noticed by Westwood, Introduction, vol. ii, p. 130, occur on the under surface of the white oak leaves in this country. These are small circular flat scales, less than a quarter of an inch in diameter, varying from a pale to a bright vivid rose red color, fading to dull red in autumn, and are attached to the leaf by a short slender footstalk. So much do they resemble a parasitic plant growing upon the leaf that they have been a subject of much controversy among writers. I have not as yet succeeded in obtaining the flies from them; but they will no doubt yield a species different from that of Europe. For, it may have been observed, that several of the galls above described appear to be the same with some of those growing on the oaks of the old world, yet the insects coming from them are manifestly different.

321. FOREST CATERPILLAR, *Clisiosampa silvatica*, Harris. (Lepidoptera. Bombycidæ.)

A caterpillar closely resembling that of the Apple-tree, § 28, but at once distinguished from it by having a row of diamond-shaped or oval white spots along the middle of its back instead of a white stripe; living in large societies, under a slight thinly-woven cobweb-like nest placed lengthwise against the side of the tree, and coming out to feed upon the leaves; when nearly grown dispersing themselves and wandering about; spinning a cocoon like that of the Apple-tree caterpillar, in which it lies twenty days, the moths appearing abroad the fore part of July, these being pale umber brown or cinnamon color, their fore wings gray and crossed by two narrow oblique bands, parallel with each other and with the hind margin, these bands dark brown instead of whitish as in the Apple-tree moth, and often obliterated by the whole space between them being dark brown; its width 1.25 and the female 1.75.

This caterpillar is particularly interesting from its close similarity in

appearance and habits to our common and well known Apple-tree caterpillar. Its nests, however, are very seldom seen, even though diligently sought, being of so slight a texture and placed along the side of the trunk or of one of the larger limbs of the tree, and hereby rendered inconspicuous. It is only after the worms leave their nests and are leisurely rambling about singly, that they come to our notice. Almost every year, the fore part of June, some three or four of these wanderers may be observed, and occasionally a season arrives when they are remarked as much more common, but never numerous. This, in brief, has been their history, within the sphere of my own observation. Abbot states (Insects of Georgia, p. 117,) that they are "sometimes so plentiful in Virginia as to strip the oak-trees bare." He was probably misinformed, however, upon this point; for Dr. Morris, of Baltimore, informs me they are no more common in that district than I represent them to be here in New York, and nothing approaching to the statement of Abbot has ever been known there, at least by the present generation. In his own vicinity in Georgia, Abbot says it is rare. It thus appears that this caterpillar is about equally diffused throughout our country and is nowhere common.

The CATERPILLAR, as seen after it has forsaken its nest and is wandering about, is an inch and a half long and 0.20 thick. It is cylindrical and of a pale blue color, tinged low down on each side with greenish gray, and is everywhere sprinkled over with black points and dots. Along its back is a row of ten or eleven oval or diamond-shaped white spots which are similarly sprinkled with black points and dots, and are placed one on the fore part of each segment. Behind each of these spots, is a much smaller white spot, occupying the middle of each segment. The intervening space is black, which color also forms a border surrounding each of the spots, and on each side is an elevated black dot from which arises usually four long black hairs. The hind part of each segment is occupied by three crinkled and more or less interrupted pale orange yellow lines, which are edged with black. And on each side is a continuous and somewhat broader stripe of the same yellow color, similarly edged on each of its sides with black. Lower down upon each side is a paler yellow or cream colored stripe the edges of which are more jagged and irregular than those of the one above it, and this stripe also is bordered with black, broadly and unevenly on its upper side and very narrowly on its lower side. The back is clothed with numerous fine fox-colored hairs, and low down on each side are numerous coarser whitish ones. On the under side is a large oval black spot on each segment except the anterior ones. The legs and prologs are black and clothed with short whitish hairs. The head is of a dark bluish color freckled with numerous black dots and clothed with short blackish and fox-colored hairs. The second segment or neck is edged anteriorly with cream white, which color is more broad upon the sides. The third and fourth segments have each a large black spot on each side. The instant it is immersed in spirits the blue color of this caterpillar vanishes and it becomes black.

Several of these caterpillars found abroad upon the last days of May and inclosed in a cage ate scarcely anything afterwards, yet did not spin their cocoons until the 16th and 18th of June, and the moths come out therefrom twenty days afterwards on the 6th and 8th of July. It selects a sheltered spot for its cocoon, such as a corner or angle formed by the meeting of two or three sides. Across this angle it first draws a curtain, which is thinly woven of white silk threads, nearly two inches in length and width. Under the space thus inclosed similar threads are crossed in all directions, in the center of which the inner pod-like cocoon is sus-

pended. This is about an inch in length and half as broad, and is placed perpendicularly, obliquely, and probably horizontally also, according to the direction of the angle in which it is situated. It is more closely and evenly woven than the parts exterior to it, and like similar fine muslin fabrics from human looms, it is "starched" by the manufacturer, to render it more stiff, smooth and substantial, the meshes between the threads being filled with a thin yellowish paste from the mouth of the caterpillar, which dried, gives the cocoon the appearance of being thinly dusted with powdered sulphur. The inclosed insect can be faintly seen through its walls. The moth issues from the upper end of the cocoon, by crowding the threads there apart after it has softened and loosened them by wetting them with a fluid from its mouth, which imparts a pale brown tinge to the orifice thus formed.

The MALE MOTH usually measures 1.20 across its spread wings. Its thorax is densely coated with soft hairs of a nankin yellow color. Its abdomen is covered with shorter hairs which are light umber or cinnamon brown on the back and tip and paler or nankin yellow on the sides. The antennæ are gray, freckled with brown scales, and their branches are very dark brown. The face is brown with the tips of the feelers pale gray. The fore wings are gray, varied more or less with nankin yellow, and they are divided into three nearly equal portions by two straight dark brown lines which cross them obliquely, parallel with each other and with the hind margin. The space between these lines is usually brownish and darker than the rest of the wing, being quite often of the same dark brown color as the lines, whereby they become wholly lost. Sometimes the hind stripe is perceptibly margined on its hind side by a pale yellowish line. The fringe is of the same dark brown color with the oblique lines, with two whitish alternations towards its outer end. But sometimes it is of the same color with the wings and edged along its tip with whitish. The hind wings are of a uniform pale umber or cinnamon brown, sometimes broadly grayish on the outer margin, and across their middle a faint darker brown band is usually perceptible, its edges on each side indefinite. The fringe is of the same color with the wings or slightly darker and is tipped with whitish. The under side is paler umber brown, the hind wings often gray, and both pairs are sometimes crossed by a narrow dark brown band, which on the hind wings are curved outside of the middle. All back of this band, on both wings, is often paler, and more so near the band.

The FEMALE is 1.75 in width, and in addition to the shortness of the branches of her antennæ, differs from the male in her fore wings, which are proportionally narrower and longer, with their hind margin cut off more obliquely and slightly wavy along its edge. Hence also the dark brown lines cross the wings more obliquely, the hind one in particular forming a much more acute angle with the outer margin. And all the wing back of this line is sometimes paler or of a brownish ashy color. And the fringe of these wings has not the two whitish alternations which are often so conspicuous in the male. The head and fore part of the thorax is cinnamon brown. The abdomen is black, clothed with brown hairs, though very thinly so on the anterior part of each segment, where these hairs are intermingled with silvery gray scales.

The scales of the wings of this moth are very slightly attached, rubbing off with the gentlest touch, as though they were mere dust that had fallen upon the wings Hence it is almost impossible to secure specimens which are perfect and uneffaced, the insect fluttering with such strength and extreme vivacity when captured. And individuals taken when abroad in the forests are usually worthless for the cabinet, all traces of their marks being obliterated and the wings having become more or less transparent from this loss of their scales.

In addition to the oak this caterpillar is found upon the apple and cherry,

the walnut and other trees. On the apple-tree it is said to be more voracious and injurious than the common caterpillar, often nibbling the stems of the young apples and causing them to wither and fall.

Other caterpillars and large thick-bodied worms occurring on oaks are the larvæ of

The HICKORY TUSSOCK MOTH, § 183.
The AMERICAN LAPPET MOTH, § 84.
The IO EMPEROR MOTH, § 81, and
The POLYPHEMUS MOTH, § 181.

322. SENATORIAL DRYOCAMPA, or YELLOW-STRIPED OAK-WORM, *Dryocampa senatoria*, Smith and Abbot. (Lepidoptera. Bombycidæ.)

In August, consuming the leaves, a black worm with four orange yellow stripes upon the back and two along each side, with two long black horns back of its neck and the rings of its body with two black prickles above and two on each side; burying itself some five inches below the surface and the following June producing a large bright ochre yellow moth, its wings often freckled with blackish spots, the forward pair having a large white dot near the center and a faint purple streak from the middle of their inner edge to the tip; its width 2.50; the male much smaller, 1.75 wide, and its wings of a much darker purplish red color, but with the same white dot and dark streak.

These worms occasionally become quite numerous in particular neighborhoods. The latter part of August, 1858, I observed them in greater numbers than I had ever before seen, in the cemetery at Saratoga Springs, where they had stripped most of the oaks of their leaves, and were then descended from the trees, probably in search of food elsewhere, as few of them appeared to be grown to their full size. They were everywhere crawling sluggishly about, upon the surface of the dry sandy soil and up the sides of the monuments. In the paths, the dresses of the ladies sweeping over them, these worms frequently adhered to and crawled up them, to the great annoyance of every one and the alarm of the more timorous. Nor was this alarm altogether groundless. The prickles of these worms, if they happen to penetrate the skin, produce a stinging sensation like that of nettles and a slight redness of the spot, both these symptoms, however, lasting but a short time, as in the case of nettle stings. Relief in all such cases is speedily obtained by bathing the part with tincture of opium (laudanum), or with spirits of camphor.

The LARVA when full grown is two inches long and about the thickness of a lead pencil, cylindric, and of a coal black color in stripes alternating with orange yellow, as follows: Along the middle of the back is a black stripe with a yellow one of the same width on each side of it. Outside of these is a broader black stripe followed by a yellow one on each side of the back slightly broader than the two middle ones. Below these is another black stripe still wider than the one above, and below this along the sides are two yellow stripes with a black one between them in which the breathing pores are placed. The upper of these two last yellow stripes is somewhat wavy and less smooth than those on the back, and the lower one is often widened on the fore part of each segment, or sends off a branch downward and backward. Below this is an oblong yellow spot on each segment, which is sometimes lengthened to unite its anterior end to the lower yellow stripe. The under side is black with a yellow

stripe along the middle, which is more or less interrupted. The legs and prolegs are black. The yellow stripes are not prolonged upon the posterior and the two anterior rings, but are here often replaced by small yellow spots. The head is black. The skin is tough and leathery, with numerous small elevated smooth grains, of which two on the fore part of each segment, placed in the yellow stripes, are larger and are sometimes elevated into small prickle-like points, and two others, similar to these, also occur posteriorly on each segment, but placed further apart. In addition to these there are six larger, black, shining, conical prickles in a transverse row around the middle of each ring, some of which are occasionally forked at their tips into two sharp points. On the second ring in place of the two upper prickles are two black curved cylindrical horns, equalling two of the rings in length, and usually standing obliquely upwards and forwards, their tips blunt and shining. The last segment is rough from several prickle-like points of different sizes.

The moth is quite simple in its colors and marks, compared with its larva, presenting nothing to notice in addition to what has already been given above, except those structural characters which belong to other species of the genus in common with it.

323. Spotted-winged Dryocampa, or Thorny oak-worm, *Dryocampa stigma,* Fabricius.

Eating the leaves in September, a worm like the preceding, but of a bright tawny or orange color with a dusky stripe along its back and bands on its sides, and its prickles lengthened into thorn-like points; producing a moth with similar colors and marks, but having in addition thereto a slight purplish streak across the middle of its hind wings and a curved purple band near the base of the fore ones, and both pairs always freckled with blackish, its width 2.50 to 3.00, the male 1.75 and its wings ochre yellow.

The skin of this worm has numerous white elevated points or granules of different sizes, as in the following species, but differs from that and the other species of this genus in not having its colors arranged in stripes, except the single dusky one along the back. On the hind part of each ring is a dusky band, which is widened at the breathing pores. The prickles also are longer in this than in the other species, forming thorn-like points, of which those of the two rows upon the back are the tenth of an inch long, with one, two or three smaller prickles branching from them. The two horns back of the neck have the same blunt shining tips as in the preceding species.

The female moth has the fore wings usually of a purplish red color forward of the anterior band and behind the posterior one, and this color is frequently tinged more or less with glaucous-like gray. The anterior band is strongly curved, or rather, is abruptly bent slightly outside of its middle. This band is obliterated in many specimens. The narrow cloud-like streak of darker purplish red across the middle of the hind wings is sometimes quite distinct, and in other instances its presence can merely be discerned. Thus this moth sometimes can scarcely be distinguished from the preceding.

324. Clear-winged Dryocampa, or Olive-gray oak-worm, *Dryocampa pellucida,* Smith and Abbot.

Eating the leaves in July, a two-horned prickly worm of an obscure

olive gray or greenish color with dull brownish yellow stripes and its skin rough from white granules; remaining under ground in its pupa state through the winter, and the fore part of June producing a large ochre-yellow moth with thin and semi-transparent wings of a purplish red color throughout, with a very large white dot near the center of the fore pair and a faint darker streak; its width 2.50; the male 1.75, with the fore wings hyaline except on their margin.

For many years this worm has been common on the white oaks in my own vicinity, where the preceding has seldom been seen; and though the Yellow-striped oak-worm is so abundant only twenty-five miles distant from my residence, I have never met with it here.

When full grown, these worms are two inches long and as thick as a pipe stem. They vary somewhat in their colors, being oftenest obscure grayish yellow or grayish green, but sometimes blackish. Along the back is a broad stripe of this color, interrupted at the sutures by pale brownish yellow, and with a narrow blackish line on the middle of the back. Each side of this is a dull brownish stripe, below which is a broader one of the same color with that on the back, and having a whitish streak along its middle and the breathing pores in its lower margin. Below this is a second broad dull yellowish stripe, followed by a narrower dark olive green or blackish one, occupying the base of the prolegs, which below this stripe are black with a few small white granules, similar to those with which the surface is everywhere covered. The six anterior legs and the head are dull olive yellow. In a transverse row on the middle of each segment are six short polished black prickles, two above and two on each side, those on the hind segments being somewhat longer, and the two on the back are sometimes replaced on most of the segments by black dots. The two horns on the top of the second ring are the same as in the two preceding species. In smaller individuals, probably before the last change of their skin, these horns have been observed to have short branching prickles.

When alarmed the worm holds its anterior end rigidly upward and forward, with the horns extending obliquely forward and outward. Several of the worms are usually found near each other on the same limb, up to the time of their leaving the tree. They mostly enter the ground early in August, though some individuals may be seen on the trees as late as the middle of the following month.

325. TRIPLE WHITE-SPOT MEASURE-WORM, *Amilapis triplipunctata*, new species. (Lepidoptera. Geometridæ.)

Eating the leaves the fore part of June, a cylindrical gray measure-worm, 1.40 long, sprinkled with blackish dots and short lines, its head and neck slightly thicker than its body, each ring with a small squareish white spot above on its hind edge and with two blackish parallel lines on each side of this spot, its six anterior feet with a slight tinge of rose red; its pupa lying naked between the leaves, fastened by its tip; the beginning of July producing an ash-gray moth thickly sprinkled over with black dots and small brown spots, with the broad hind border of both wings dusky, which color is bounded on its fore edge by a somewhat scalloped narrow black band running parallel with the hind margin and having on its hind side near the outer margin of the fore wings three large contiguous white dots, whereof the outer one is largest and most distinct; its width 1.50.

This moth is so very similar in the cut and designs of its wings to the

unipunctata of Haworth, that it may prove to be only a variety of that species, which I have never met with in this State, and know only from specimens received from Dr. Morris of Baltimore, and the figures and descriptions of authors. In these I discern no traces of but the one white spot, whilst here there are three, in a transverse row, contiguous and somewhat confluent with each other, their edges illy defined and the inner two less clear and bright, yet perfectly distinct. The colors also are gray and blackish, without any tinge of rusty yellow. The fore wings, as in *unipunctata*, show faintly a curved darker band near the base, and a straight cloud-like streak still more faint from the middle of the inner to the middle of the outer margin, in which is a faint black crescent-shaped spot near the center, and the black band or line margining the dusky hind border has back of its inner end a curved transverse gray spot, and at its outer end a broader one of the same color, occupying the space between the outer white spot and the outer margin. The larva, moreover, of this moth, appears to be unlike that of *unipunctata*, as described by Guenée* from a drawing of Abbot's; though there can be but limited confidence in the accuracy of descriptions thus obtained. And furthermore, the Single white-spot moth is said to come abroad at the end of the season.

Authors are discordant and in doubt with respect to the place of these moths in the family to which they pertain. I am inclined to think their true location is beside the genus *Hyperetis* of Guenée.

326. Oak-leaf Tortrix, *Argyrolepia Quercifoliana*, new species. (Lepidoptera. Tortricidæ.)

The fore part of June, the sides of particular leaves curved upward and drawn slightly together by numerous cobweb-like threads, beneath which lies a slender grass-green sixteen-footed worm, about three-fourths of an inch long and the thickness of a rye straw, which eats the end of the leaf, and passes its pupa state in the same situation; about the first of July giving out a small moth of a pale straw color with its body and hind wings glossy white, its fore wings prettily speckled with numerous small rusty yellow spots which run together in many transverse bands, leaving a space at their tips more vacant; its width 0.70.

The moth here noticed may frequently be captured in our forests the fore part of July. Its larva resides under a thin cobweb covering which it constructs over the upper surface of the leaf towards its end, hereby drawing the sides somewhat together into a concave shape. As it merely eats off the end of the leaf, transversely, moving its quarters further back as it thus consumes successive portions of it, it is obviously liable to do no sensible amount of injury, unless like some of its kindred, it has the habit

* I regret that the important volumes of this author on the nocturnal Lepidoptera (Suites a Buffon) have not been in my hands a sufficient time for me to avail myself of them but slightly in the present Report. Hence, also, a number of species which I had prepared for insertion herein, are withdrawn, until their nomenclature can be revised and compared with that of these volumes.

at times of becoming excessively multiplied. But as the history of so very few of these small moths is at present known, I avail myself of this opportunity to place this species on record; and I add such a description of it as will henceforth serve for its clear identification.

The LARVA is grass green throughout, or towards each end and beneath of a slightly paler apple-green color, and along its back is a narrow stripe of a deeper green, produced by the internal viscera. It tapers slightly posteriorly and less so anteriorly. On each of its rings small pimples are symmetrically placed, from each of which grows a short white hair; and low down on each side is a slight fold of the skin, forming a slender elevated line. The head is round and slightly flattened and as thick as the neck into which it is sunk. If expelled from its retreat, it wriggles violently about, and by means of a fine thread drops itself very suddenly towards the ground and hangs suspended, till the disturbance ceases, whereupon it climbs up again to its former quarters.

The MOTH has fore wings which are twice as long as wide, their opposite sides parallel, their outer side very nearly straight with an inward curve at the base, their hind ends cut off somewhat obliquely and rounded like a slightly bent bow. Their surface is feebly glossy and about equally occupied by straw yellow and tawny or light brownish yellow, this latter color forming numerous small spots which are confluent into broken and irregular bands, the bands also running into each other. Two of these bands are more distinct and continuous, and when viewed vertically are of the same tawny yellow color with the other marks, but when viewed obliquely they are of a darker leaden or silvery brown hue, and are imperfectly edged with lines of a deeper brown color. One of these bands extends from the middle of the inner to the fore part of the outer margin. The other is almost parallel with this, running from the hind margin near the inner angle to the outer margin, where it is usually thickened or forked. The space back of this last band is slightly paler and less densely spotted, its only marks frequently being a broad oblique stripe from near the middle of the band to the tip, crossed by a curved band running nearly parallel with the hind margin, both these marks having the same leaden brown reflection with the two bands. Back of this on the hind edge and base of the fringe is a smooth tawny yellow band. The head is rough from loose scales, the feelers projecting in front like a short conical beak, their apical joint being small but distinct; and the spiral trunk is quite short, when uncoiled reaching but little beyond the tips of the feelers.

327. OAK LEAF-MINER, *Argyromiges Quercifoliella*, new species. (Lepidoptera. Yponomeutidæ.)

A whitish blister-like spot half an inch long and showing upon both surfaces of the leaves of the white oak, this spot on the upper side elevated into a fold, forming a cavity in the interior of the leaf, in which lies a small white flattened worm abruptly thicker at its fore end, which feeds on the interior of the leaf, and passes its pupa state in the same cavity, finally producing a minute snow-white moth, its fore wings pale golden yellow with a black dot on their tips, a white stripe on their outer side at base, and four triangular silvery white spots along the outer and two larger ones upon the inner margin, its width 0.30.

This leaf-miner is a minute worm which subsists upon the parenchyma or green pulpy substance inside of the leaf. This it consumes, leaving the cuticle or thin outer skin which covers it entire. The worm is flattened and little thicker than writing paper, appearing as though it had been distorted from being pressed between the two surfaces of the leaf. Upon the under side of the leaf its cell resembles a blistered spot of a dull nankin yellow color and an irregular oval form, half an inch long or a little more

and half as broad. In smallish leaves this cell extends from near the mid-vein quite to the outer margin, where it is most elevated, the margin being often drawn together into a plait or fold as though it had been pinched between the fingers. Thus at this blistered spot a deep cavity is formed between the flat skin of the under side and the elevated fold of skin upon the upper side of the leaf. On this latter side the spot is white, more or less stained with dirty yellow and showing upon its surface a net-work of dirty yellow lines which are the veinlets of the leaves, made thus conspicuous by the parenchyma in the cells between them having been consumed. This dirty yellow stain renders the spot so opake that the worm inside can seldom be seen. This concealment is the more necessary, to enable the inclosed insect to elude the search of its enemies. It remains in this cell till near the end of its pupa state, held near the center of the cavity by a number of fine threads like cobwebs irregularly crossed in every direction. And when ready to disclose the moth, the pupa breaks through the thin dry skin of the under surface of the cell and crowds itself out till it is only held by its tip, when its shell cracks apart and the moth evacuates it. Sometimes a spider's web may be noticed on the under side of the blistered leaf, placed there with the evident purpose of entrapping this pupa when it breaks from its cell.

It is the latter part of summer when these blister spots begin to appear on the oak leaves. They occur upon the topmost leaves of the tallest trees as well as on those that are lower and near the ground. After the leaves have fallen in autumn, a portion of these blisters will be found empty, whilst others have pupæ or sometimes larvæ in them; showing that the moths come out from them in autumn and also in the spring.

The LARVA is white with a dusky or cinnamon brown stripe along its middle from internal alimentary matter, and the tips of its jaws are bright cinnamon brown. It is sparsely clothed with fine long white hairs. Its shape is analagous to that of a Buprestis larva, the segments of its thorax being much broader than those of the abdomen, which are of equal width. It has three pairs of legs anteriorly and three pairs of very small prolegs placed on the third, fourth and fifth narrowed abdominal rings.

The PUPA lies naked in the centre of the fine threads which the larva spins across its cell, without inclosing itself in a cocoon. It is at first pale yellow throughout, but the sheaths of its wings and legs afterwards become dusky and its head blackish. When disturbed in its cell it writhes or turns itself over and over, with much strength and vivacity.

The MOTH is snowy white with the antennæ and feet a little dusky. Its fore wings are pale golden or shining tawny yellow, with five white streaks on the outer margin, of which the first is longitudinal, placed on the margin and widened towards its hind end; the others are triangular and margined on their fore sides by a black line, the second and third ones being more transverse, and the fourth or last one is directed obliquely forward and inward. The two spots on the inner margin are also edged with black on their fore sides. The first of these spots forms with its opposite when the wings are closed a large crescent-shaped spot across the middle of the back, and the second forms a transverse diamond-shaped spot. The fringe is white with a dusky line on its base, and its outer half dusky also along the tip. The hind wings are white or cream yellow, and their fringe silvery white.

328. WHITE-OAK LEAF-MINER, *Argyromiges Querci-albella*, new species.

Eating the interior of White-oak leaves and hereby producing a white

blister-like spot on their under sides, a minute flattened pale yellow worm which is gradually narrowed from before backwards, 0.18 long when mature, surrounding itself with a thin membrane-like wall forming an oval cell in the center of the cavity, in which it remains during its pupa state; producing a minute snow white and silvery moth, its fore wings pale golden yellow posteriorly, where are three black lines on the outer and two on the inner margin radiating from a common center and bordered with silvery white on their hind sides, and with a large black dot on the tip and a blackish stripe at the base; width 0.28.

The white blister-like spot of this leaf-miner appears on the under side of the leaf, with but slight, if any traces of its presence on the opposite side. It is broad oval and a half or three-fourths of an inch long. Among the fallen leaves in autumn those thus blistered may be found, some having the insect in its larva, others in its pupa state. The larva is very much flattened and tapers gradually from before backwards. It is divided into thirteen very distinct segments, including the head, by deeply impressed transverse lines. It is of a pale yellow color, with a deeper orange yellow band on the middle of each segment, and it also sometimes shows a dusky longitudinal stripe along the middle, from internal visceral matter. Its head is small, and its legs the same as in the preceding species. If ejected from its cell, it wriggles and lets itself down by a fine thread which it spins from its mouth. When it has finished feeding it stations itself in the middle of its burrow and then weaves around itself a curtain, from the floor to the roof, of a fine dense texture resembling the paper of bank bills. It thus forms a little oval cell nearly a half inch long and two-thirds as wide, and almost a tenth of an inch in height, the floor and roof being concave, as though they had been pressed outwards, thus making the apartment more roomy. In this cell the insect reposes during its pupa state, with its cast-off larva skin beside it, the black grains or castings of the worm and all other rubbish being outside of this in the burrow. The pupa is of a uniform dull orange yellow color, and of the same length with the larva.

The moth appears to be closely like the European *Argyromiges Clerckella*, but possessing some marks not mentioned by authors as present in that species. Its fore wings are snow white on their anterior half, with a shining silvery luster, and with a blackish stripe inside of their outer edge. Their posterior half is of a pale golden yellow color, with a large black dot at the tip and three or four triangular spots on the outer and two on the inner margin, each spot with a black streak on its anterior edge, which streaks radiate from a common center. On the hind margin is a black band. The fringe is white, tipped with blackish on the outer half of the wing. The long narrow hind wings and their long fringes are silvery white. I have captured these moths abroad in the woods the latter part of May.

2. THE LOCUST.—*Robinia Pseudacacia.*

AFFECTING THE TRUNK AND LIMBS.

329. Locust-tree borer, *Clytus Robiniæ*, Forster. (Coleoptera. Cerambycidæ.)

Boring a hole nearly a quarter of an inch in diameter, beneath the bark and more or less deeply into the wood, usually in an upward direction; ejecting its chips and worm-dust through an orifice in the bark; a yellowish white worm similar in its appearance to the Oak pruner, § 305; passing its pupa state in its burrow, and beginning to be seen abroad soon after the middle of August, and often seen during the autumn on Golden rod and other flowers; a black nearly cylindrical long-horned beetle from a half to three-fourths of an inch long, its legs and sometimes its antennæ tawny yellow, its globular thorax and its wing-covers ornamented with several bright lemon-yellow bands, of which the second one back of the base of the wing-covers forms a letter W.

This is a common insect, and the greatest obstacle to the cultivation of the locust-tree with which we have to contend. An instance of the devastation it is liable to cause may here be recorded. One of the principal thoroughfares leading east from the city of Utica, was formerly planted on its south side for some distance with locust-trees. These had become so large and ornamental as to render this one of the most admired avenues in the suburbs of that city, when, some thirty years since, these trees were invaded by this insect, to such an extent that in the course of two or three seasons they were totally ruined, many of them being killed outright and the remainder having their limbs and branches so lopped off that they could never recover from the deformity. We learn from Micheaux that fifty years since, this insect had become so destructive that many in different parts of our country were discouraged from planting the locust. Hitherto it appears to have been a pest chiefly in the older settled sections of our country. But it will no doubt in time show itself equally destructive in the newer districts. And in those parts of the western States where, to supply in some measure the natural deficiency of wood and timber, plantations of the locust are extensively made, it will probably yet prove to be a greater evil than it has ever hitherto been.

This insect abounds in all parts of the United States. A recent writer, in one of our agricultural periodicals, says it has not yet made its appearance on the west side of the Mississippi river; but from the number of specimens sent me year after year, by Wm. S. Robertson, from the Indian territory west of the State of Arkansas, it would appear to be more common there than in this section of the country. And it in all probability occurs over all that portion of our continent in which the locust grows.

Another writer says, it "is not of more than thirty years introduction into the United States." But Drury informs us he "received it from New York, where it is found on the locust-tree." And Forster says, it "inhabits the *Robinia Pseudacacia* in the province of New York." It hence appears that this beetle and its habits were known in our State almost a century ago. And fifty years anterior to these writers, Petiver gave a figure and description of it, in his "Gazophylacium," published in London in 1702, this being the first notice of it, probably, which has ever appeared. Moreover, as this beetle has never been found in any other part of the world, it was not introduced, but is undoubtedly a native species which has always existed here.

From our American authorities, one would be at a loss to know by what scientific name to designate this insect. It is the *Clytus pictus* of Dr. Harris's Treatise, the *Clytus Robiniæ* of Prof. Haldeman's Monograph, the *Arhopalus Robiniæ* of Dr. Le Conte's Monograph, though changed in the *errata* to *Arhopalus pictus*, and still later, in the Smithsonian Catalogue of Coleoptera, *Clytus flexuosus* is its preferred name. It fortunately happens in this instance, that of the several names the species has received, that which is preferable and most appropriate is that which also has the priority. It is circumstanced like another species which I have heretofore noticed. It was figured and described by Drury in 1770 but no name was then given to it. In 1771 Forster described it, naming it *Leptura Robiniæ*. Drury, in the appendix to his second volume, which was published in 1773, supplied the names which had been omitted in his first volume, terming this species *Leptura picta*. And two years after this, Fabricius, in his Systema Entomologia, first noticed this species, naming it *Callidium flexuosum*, removing it into his new genus *Clytus* twenty-five years afterwards. Dr. Le Conte refers it to the genus *Arhopalus* of Serville, making this genus more comprehensive than its author originally proposed, Serville himself placing it under *Clytus*. Which is the better generic arrangement I do not pretend to decide.

This beetle is so prettily and peculiarly marked that it will readily be recognized, from the short description given in the opening paragraph above. It is subject to some variations. The antennæ are either black or tawny yellow. Sometimes the base of the wing covers are tawny yellow. Sometimes the zigzag band resembling the letter W is white instead of yellow; and specimens even occur in which all the bands are white. This insect breeds in the black walnut as well as the locust, and it is said to be individuals reared in this tree which have the bands more or less white.

The only feasible method of checking the multiplication and destructiveness of these borers, which I am able to suggest, is, to plant a small patch of the Golden rod (*Solidago*) where locust trees are grown, that the beetles when they issue from the tree may resort to the flowers, as is their habit. They can readily be found thereon and captured and destroyed. It will be a pastime to the children of the household, whose sharp eyes qualify them

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well for this employment, to search these flowers, more or less frequently as the search is more or less successful, varying as it will with the commonness or rarity of the insects in different years, gathering and destroying all that are found thereon.

The LOCUST COSSUS, already described, § 294, bores similar but still larger holes and more in the interior of the tree. Fortunately it is a much less common insect than the Locust borer.

AFFECTING THE LEAVES AND TWIGS.

The IO EMPEROR MOTH, already described, § 81, I find is frequently reared upon the locust, and is the largest worm known to us feeding on the leaves of this tree. The parent moth deposits her eggs in a cluster side by side, glueing them to the under surface of a particular leaf, which leaf sometimes fades and turns yellow, probably in consequence of the weight thus placed upon it. The eggs hatch soon after the middle of July, and the young worms for two or three days remain huddled together upon the under side of the same leaf, feeding upon the shells of their eggs till they are wholly consumed, before they commence eating the leaves. They are at first of a totally different color from the large worm which we afterwards see, being dull yellow with black heads and small black prickles like the points of needles. They remain at rest during the day, and feed by night, all repairing to a leaf adjacent to that on which they were born, and eating its end off transversely till a third or more of it is consumed, when they repair to another leaf in the same vicinity. But if the leaf on which they are resting be touched by the hand, or if they in any other manner discover they are noticed, they on the following night migrate to another part of the tree, there clustering together again on the underside of a single leaf. But they soon grow to such a size that a single small leaf of the locust cannot hold the whole brood, when they begin to separate. After they have grown to a half inch or more in length they prefer the small young leafets at the end of the main stems, all of which leafets they eat, together with the tender succulent end of the stem, for a short distance downwards, and then leave it and repair to the end of another stem, feeding now some of the time by day. When they become so large that the under side of a leaf is quite too small to cover and conceal them, each worm draws three or four leaves around it with a few silken threads, forming a kind of loose basket open at the top, in which the worm lies when it is not feeding. Sometimes two worms unite in forming and occupying one of these baskets.

The HICKORY TUSSOCK MOTH larva, § 183, or a caterpillar very similar to it, is also sometimes found on the locust.

330. TITYRUS SKIPPER, *Eudamus Tityrus*, Fabricius. (Lepidoptera. Hesperidæ.)

The last of July, under a folded edge of a leaf when small, afterwards in two or more leaves drawn together in a kind of pod, a pale green worm with darker green bands, red neck and rough dull red head, 2.00 long

when full grown; the pupa wintering in a slight cocoon coated outside with shreds of dead leaves; the middle of the following June giving out a dark brown butterfly with a yellow glossy band on the middle of its fore wings and a broad silvery white one narrowing outwardly, across the middle of the hind ones on their under side, its width 2.00. See Harris's Treatise, p. 243.

331. BLACK LOCUST MIDGE, *Cecidomyia Pseudacaciæ*, new species. (Diptera. Tipulidæ.)

In July and August, the tender young leafets near the tip of the stem folded together like a little pod, the cavity inside containing from one to three small milk-white maggots, which descend below the surface of the ground, remaining there in their pupa state about ten days, and then hatch a small blackish midge, the base of its thorax tawny yellow, its abdomen pale yellowish with the tip dusky and clothed with fine hairs as is the neck also, its legs black with the thighs pale except at their tips, its wings dusky, feebly hyaline, with the fringe short, its antennæ with thirteen short cylindrical joints separated by short pedicels, its length 0.065 to the tip of the body in the females, which is the sex now described.

Before the small young leafets, which put forth along the opposite sides of the main leaf stalks at their tips, become expanded, they are closed together like two leaves of a book; and it is probably at this time that the female midge inserts her eggs in the cleft between them, the irritation from which and from the small maggots which hatch from them, keeps the leafet permanently closed, a slight cavity forming within, in which the worms reside, the leafet hereby coming to resemble in its shape a small bivalve shell, of the genus *Chama*, the margin being usually more or less wavy. The surface remains unchanged outside, but within it assumes a pale greenish yellow color. The larvæ are milk-white and somewhat glossy, with a light green cloud along the middle of their bodies from alimentary matter internally in the viscera. When menaced with danger, they have the faculty of throwing themselves away with a sudden skip, the same as the larvæ of the Wheat midge. The attachment of the leafets to the stalk becomes so weakened when infested by these worms, that I presume they are generally broken off by the wind and the worms are thus carried to the ground, instead of crawling down the stalks by night as is the habit of the Wheat midge.

I notice these pod-like leafets every summer, upon the locusts in my yard, as well as the deformity produced by the following species; but neither of these insects have ever been so numerous as to injure the trees in any sensible degree, in my vicinity.

332. YELLOW LOCUST MIDGE, *Cecidomyia Robiniæ*, Haldeman.

In July and August a portion of the edges of the leaves rolled inwards on their under sides and thickened, inclosing one or two very small white maggots which are varied more or less with orange yellow; producing a

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pale orange midge with the sides of its thorax and often three oval stripes on the back and the wings dusky, its antennæ blackish and of fourteen joints in the females, twenty-four in the males, its length 0.12.

In midsummer the margins of many of the leafets of the locust may be noticed rolled inwards upon their under sides for a length varying from over a quarter to a half inch, the upper side showing a concavity or rounded hollow at this point. This rolled portion is changed in its color to a paler yellowish green, and its texture is thickened and succulent. The same leaf sometimes has two or more of these folds along different parts of its margin. The worm concealed therein is colorless-watery when young, becoming, as it approaches maturity, opake and milk-white varied more or less with bright yellow. It is long oval, broadest in the middle and tapering thence to a sharp point anteriorly, the opposite end being bluntly rounded, and is divided into thirteen segments by transverse impressed lines.

Prof. Haldeman, who described this species in Emmons's Journal of Agriculture and Science, October, 1847, says it, in conjunction with the following species, had been so numerous in south-eastern Pennsylvania, the two preceding summers, as to kill the leaves upon the locusts, the trees in August appearing as though they had been destroyed by dry weather.

333. LOCUST HISPA, *Anoplitis scutellaris*, Olivier. (Coleoptera. Hispidæ.)

In July, blister-like spots appearing upon the leaves, within which is a small flattened whitish worm, attaining a quarter of an inch in length, tapering from before backwards, with projections along each side like the teeth of a saw, and with only three pairs of feet, which are placed on its breast; eating the parenchyma and leaving the skin of the leaf entire; remaining only a week in its pupa state, in the leaf, and towards the middle of August, coming out therefrom a small oblong flattish beetle of a black color with the thorax and wing covers, except along their suture, tawny yellow, its length 0.25.

This is the *Hispa suturalis* of Dr. Harris, (Boston Journal of Natural History, i, 147, and Treatise on Injurious Insects, p. 107,) but cannot be the species thus named by Fabricius and Olivier, which is stated to have the head, under side and legs, yellow or testaceous. It is very plainly described by Olivier under the name *scutellaris*. Though the species is common in the southern part of New York, I have never met with it in the eastern section of the State, where the following which much resembles it in its habits and larva, is common.

334. FLATTENED LOCUST LEAF-MINER, *Anacampsis Robiniella*, new species. (Lepidoptera. Yponomeutidæ.)

In July, white blister-like spots on the under side of the leaves, occupying about a fourth of the surface or half the space on one side of the mid-vein, containing within a flattened pale green or whitish worm, tapering

posteriorly, with a darker green streak along its middle; passing its pupa state in the leaf, which falls to the ground, and the following June gives out a minute moth 0.45 wide across its spread wings, which are blackish brown on their outer half, tawny yellow on their inner side, and marked with an oblique white band before the middle, a broad grayish white band or large triangular spot on the middle, and half way from this to the tip a white spot on the outer and a pale rose red one opposite it on the inner margin, and also a small white spot on the tip and on the base.

Of the seventeen small leaves or leafets which commonly form each compound leaf of the locust, usually two or three, and frequently double that number, show these white blisters on their under sides. And it is not rare to see two or three of them upon the same leafet, which usually turns yellow and drops prematurely from the tree, when thus severely invaded. But where it has only one insect preying upon it, it usually remains green and survives the attack. For of the two layers of parenchyma in the leaves, it is only the lower that is ate by these worms, the upper one being left entire, whereby the upper surface of the leaf remains green, or is but slightly discolored with a yellowish cloud at this place. The white separated skin of the under surface is very thin and delicate, so much so that frequently the worm may be perceived beneath it, sometimes feeding at the outer edge of the spot, but more commonly at rest towards its centre, or turning its head with a sudden spiteful jerk, first to one side and then to the other, being evidently aware that it is interfered with, and resorting to this motion to frighten away the intruder. And not unfrequently two worms are seen occupying the same cavity.

The LARVA when young and as found in the smaller spots, is of a very pale green or white color with a darker green or a pale brown streak along its middle. It is very much flattened, and is broadest anteriorly across its neck, gradually tapering from thence to the tip. It is divided into thirteen segments by deep transverse constrictions, giving it a serrated appearance along each side, and from the tip of each of the projecting teeth arises a short white hair. When full grown it measures 0.18 in length and then presents a somewhat different aspect, the middle of the body being now as broad or slightly broader than the anterior end, with the sutures more deeply impressed, and the projecting teeth along each side are rounded and not so angular at their ends as before, and are of a yellow color, at least those at each end. And now small retractile legs are perceptible, enabling the worm to move about with more facility than when it was young. There are three pairs of small conical watery-white legs placed on the three thoracic segments, and on the third, fourth and fifth abdominal segments is a pair of minute pro-legs, scarcely to be discerned except when the worm is crawling.

The pupa lies in a small, broad, oval cocoon, 0.18 long, and 0.12 thick, woven of exceedingly fine white silk, through the sides of which the insect within is seen, of a pale yellowish color. This cocoon is suspended near the centre of the cavity, by a few threads of fine silk, crossing irregularly in different directions; the cavity in the leaf having now become much more deep and spacious than when it was first mined by the worm. The manner in which nature has so adjusted her work, here, as to cause this cavity to grow more deep and roomy, is truly curious. We have already stated that it is only the lower layer of the parenchyma of the leaf on

which this worm feeds. This being consumed from the mid-vein to the outer margin, the thin membrane of the under surface of the leaf which is hereby separated, loses its vitality and ceases to grow; whilst the upper layer of parenchyma, being uninjured, continues to expand. But the dead membrane on its under side holds it, like a bridle, from expanding further outwards, and it hence bulges upward, convexly. Thus the cavity in the leaf assumes the shape of an oven, its floor flat and its roof arched or concave. Thus ample room is furnished for the cocoon to be suspended, like a hammock, in the centre of the cavity.

Frequently, instead of the cavity in the leaf being occupied with a few fine threads supporting a cocoon in the centre, we meet with one or two smaller and much narrower snow-white cocoons, promiscuously placed. They are 0.12 long and a fourth as broad. In due time the ends of these cocoons are raised, like a lid, and a minute parasitic fly comes from them, the larva of which have subsisted upon and destroyed the larva of this leaf miner. It pertains to the family *Braconidæ*, and the genus *Microgaster*, and may be called

THE LOCUST LEAF-MINER PARASITE, *Microgaster Robiniæ*.—It is cream yellow or straw yellow, with the antennæ and legs pure white, the female being deeper yellow or orange, with the tip of the abdomen often dusky. Its wings are pellucid whitish, with colorless veins, the small central cellule being open on its hind side. The male is 0.07 long, and to the tip of its wings 0.11, its antennæ being 0.10.

335. SLENDER LOCUST LEAF-MINER, *Argyromiges Pseudacaciella*, new species. (Lepidoptera. Yponomeutidæ.)

In similar white blister-like spots, a much more slender worm, not flattened, very deeply constricted at the sutures and resembling a string of beads; producing a minute moth only 0.24 in width, its fore wings golden yellow with four white bands on their outer side, the forward ones oblique, broader and edged with black lines, and also three or four similar white bands on their inner side and a large black dot on their tip half encircled with whitish.

This larva occurs in the blister-like spots of locust leaves at the same time as the preceding, but is at once distinguished from it by its more slender form, very little tapering from before backwards, and not at all flattened. Its legs are also much larger and more distinct, showing three pairs anteriorly, three on the middle abdominal segments and one pair at the tip. A few soft hairs are scattered over its body. Its head is small and is sometimes wholly retracted within the neck. It is divided into twelve rings by very wide deep constrictions, giving to the worm a striking resemblance to a string of very small beads, usually of a watery whitish color with a brown line along the middle, but sometimes curiously diversified from internal alimentary substances in different stages of digestion. Thus a worm was in one instance noticed as having the three first rings

white, the four following ones light green, the next, or eighth of the series, light yellow, the ninth and tenth pale brownish green, the eleventh blackish, and the last semi-transparent and like colorless glass—as though it were designed to imitate a string of beads of different colors. Its length when full grown is 0.18. The convex upper side of its cell forms a kind of fold or plait, in which the worm spins its cocoon, which is snow-white and more closely woven than that of the preceding species, and the pupa enclosed therein is of a darker or dusky color. A portion of these pupæ probably remain unhatched during the winter, lying in their burrows in the dead fallen leaves. Others give out the moths in autumn, and as cold weather comes on these delicate tiny creatures creep into the crevices under the loose scales of bark upon the trunks of trees, and similar situations, where they remain in a torpid state through the winter, and if so fortunate as to escape the notice of the spiders which hide themselves in the same places, they come abroad again upon the wing the following spring.

The genus *Argyromeges* of Mr. Curtis, to which this and two species on oaks described in the preceding pages pertain, comprises quite a number of very minute moths, as will be inferred from their larvæ occupying such a narrow space as half the thickness of leaves so thin as those of the locust. But what they lack in size is in many of the species compensated in the brilliancy of their colors and the prettiness of their adornment. Men have often exerted themselves to write the Lord's prayer or the decalogue within the compass of a sixpence, and it would seem that in these minutest kinds of moths as in many other insects Nature had aimed to show how much splendor and elegance she could include within the smallest limits. In this genus the fore wings are frequently of the most brilliant golden and silvery hues and marked with oblique streaks. They are narrow and rolled around the body when at rest. The hind wings are very narrow and fringed on both sides with long fine hairs. Their heads have a rough uncombed appearance from a tuft of dense erect and radiating bristles placed upon the crown.

This species is allied to *Klemannella* and other similar European moths of this genus in its colors and marks. Its fore wings are of a uniform brilliant golden color, with four silvery white triangular spots or bands on their outer half, which are bordered with black and are placed at nearly equal distances from each other, the anterior two being larger and placed obliquely and the others transverse. On the inner half of these wings are also three or four similar bands, the two last ones with their inner ends running into the ends of the two hind ones of the outer side. On their tips is a large black dot with a broad whitish border on its hind side, followed by a curved black band on the hind edge of the wing, beyond which comes the fringe which is of a smoky gray color. Often a longitudinal black indentation or short stripe occurs on the middle of these wings forward of the black dot and between the inner ends of the second and third bands. The hind wings are blackish with a smoky gray fringe. The legs are alternately banded with white and black.

I have sometimes met with numbers of these moths in their winter quarters beneath the large loose scales of bark on hickory trees, and at such a distance from any locust trees as to render it probable they had

been nurtured in the leaves of some other tree, perhaps those of the hickory. Minute moths of several other species are met with, in company with them in this situation, some of them of this same genus and so closely resembling the locust leaf-miner that they merit a notice in connection with it, although I know not the kind of leaves in which they are reared.

336. MORRIS'S LEAF-MINER, *Argyromiges Morrisella*, new species.

This moth is similar to the preceding in its size and marks, but the entire inner half of the fore wings is black, slightly tinged posteriorly with golden yellow, and interrupted at equal distances by three white spots or short bands narrowing towards their inner ends, and between each of these is a less distinct white spot or cloud. Forward of the anterior white spot the color is more pure and coal-black, forming an oblong square spot occupying the inner half the base of the wing, which spot is bordered along its inner side by a slender white stripe placed upon the middle of the wing at its base, its hind end uniting with the inner end of the anterior white spot.

337. UHLER'S LEAF-MINER, *Argyromiges Uhlerella*, new species.

This resembles *Pseudacaciella*, but is throughout of paler colors, the fore wings being golden gray, with five white spots along their outer sides, of which the hindmost ones are small, the others quite large and bordered with blackish upon their anterior sides; and the black dot on the tip of the wings is here replaced by a short black stripe thrice as long as it is wide; whilst the hind wings and their fringes are pale silvery gray. These marks will suffice to distinguish this from the two preceding species.

333. OSTENSACKEN'S LEAF-MINER, *Argyromiges Ostensackenella*, new species.

Another moth of this genus, which comes abroad in July and August and sometimes enters opened windows in the evening, alighting around the lighted lamps upon our tables, I here introduce to notice, it having much similarity to those above described. Its body, hind wings and all the under side is black, its head silvery white, and its fore wings of a deep orange tint with the brilliancy of gold. These wings are crossed by four equidistant straight broad silvery white bands, each edged on its fore side with a black line, the second of these bands being placed in the middle of the wing and the two hind ones having an interruption in their middle. There is no black dot on the tips as in the preceding species, but on their hind edge is a curved black line. Its width when the wings are spread is but 0.20.

Numerous other leaf-mining moths of our State pertaining to this and kindred genera are known to me, some of them rivalling or surpassing the preceding in their highly burnished metallic colors and the elegance of their marks, but as they have less resemblance to the Locust leaf-miner, there is no occasion for a particular notice of them in this connection.

LOCUST. LEAVES.

339. SAY'S WEEVIL, *Apion Sayii*, Schonherr. (Coleoptera. Attelabidæ.)

From June till September, eating numerous small round holes in the leaves, a little black weevil with a slender projecting beak, its thorax with close coarse punctures and an oval or longitudinal indentation back of its centre, and the furrows of its wing-covers with coarse punctures, its length 0.09 and to the end of its beak 0.12.

This species is common throughout the United States and is perhaps the most numerous of any beetle of the weevil kind which we have in our country, but being so very small it is seldom observed. It probably breeds in the seeds of the locust and of various other species of the Natural Order *Leguminosæ*, Dr. Harris having met with it in all its stages in the seeds of the Baptisia or wild indigo. It would be regarded with confidence as forming two or three distinct species were specimens in the cabinet alone examined. Thus, among a number of individuals taken upon the leaves of the locust, some will usually be met with in which the indentation back of the centre of the thorax is round and appearing like an impression made by the head of a pin, instead of being oval or oblong. And in others this indentation is prolonged, forming a small furrow along the middle of the thorax its whole length. It is quite customary at the present day to regard all such differences in the sculpture of beetles as sufficient characters by which to separate them into distinct species. We however cannot but deem that a large portion of the species which are thus founded will eventually be discovered to have no valid existence in the domain of nature.

340. TWO-SPOTTED TREE-HOPPER, *Thelia bimaculata*, Fabricius. (Homoptera. Membracidæ.)

In September, puncturing the twigs and sucking their juices, a brown triangular tree-hopper 0.50 long and having a form analagous to that of a beech-nut, with a long horn running obliquely forward and upward overhanging the head and compressed and rounded at its end, a large oblong bright yellow or dull gray spot on each side, widening anteriorly, its thorax as long as the wings, sharp-pointed at its tip and with elevated lines posteriorly.

I have never met with this species north of Albany, although it is not rare in the southern part of this State and of New England, and extends from thence through the southern and south-western States.

The BUFFALO TREE-HOPPER, § 21, is also common upon the locust, stationing itself in the axilla or angle where the leaf stalk arises from the limb. In August, upon the green succulent twigs it is not rare to find one of these tree-hoppers thus stationed, at the base of almost every leaf.

3. THE ELM—*Ulmus Americana et fulva.*

AFFECTING THE TRUNK.

341. TRIDENT SAPERDA, *Saperda tridentata*, Olivier. (Coleoptera, Cerambycidæ.)

Consuming the inner bark of the slippery elm, (*Ulmus fulva*,) in decaying and dead trees, a white grub about half an inch long, slightly tapering and with strongly constricted sutures dividing it into twelve rings, of which

the first is largest and has a flattened tawny space above covered with minute rust colored dots; its pupa lying in an oval cavity in the bark and the latter part of May coming out, a cylindrical blackish long-horned beetle with an orange yellow or red stripe along each side of the body, which on the wing-covers sends three equidistant branches inward towards the suture, the two hind ones oblique, its length 0.38 to 0.55.

Where the slippery elm trees are killed, as they all are in my own vicinity, by having the bark peeled from around their trunks for medicinal purposes, the remaining bark immediately becomes filled with these worms, by which all its inner layers are consumed within a few months and changed to worm-dust. The beetle deposits its eggs upon the bark in June, and the young larvæ therefrom nearly complete their growth before winter, and soon after warm weather arrives the following spring they pass into their pupa state.

The LARVA when mature is about 0.55 long and 0.12 broad across the anterior end where it is broadest and slightly tapers from thence backward. It is divided into twelve segments in addition to the head, separated from each other by deep wide constrictions, the last segment being double or having a small additional segment received into its apex. Along the middle of the back is an impressed line or furrow. It is of a white color and clothed with fine short hairs. Its head is tawny yellow and sunk into the neck, the jaws black and slightly notched at their tips or two-toothed. The neck or first ring is the longest one in the series and has a flattened space on its upper side of a tawny tinge and covered with numerous minute rust-colored points but showing no impressed line along its middle, and on its under side in the middle is a faint transverse oval spot with similar rusty dots, and upon each side is a shining impressed crescent-shaped spot of a tawny tinge. The two segments following this are shorter than those beyond them.

The surface of the beetle is occupied with small punctures from which numerous fine short hairs arise, which stand erect. This surface is of a glaucous grayish tinge, and on each side of the thorax below the orange stripe are two black dots. All the specimens which I have seen from the southern part of the State have an aspect so different from those of my own vicinity, that in the collections of amateurs they may frequently be noticed arranged as distinct species. They are of a darker livid gray hue, and their marks are dark orange red, instead of ochre or orange yellow, and on the wing-covers these marks are more prolonged, the middle one extending to the suture. This may be named the Red-marked (*rubro-notata*) variety.

Another variety is sometimes seen, in which the branches from the lateral stripe upon the wing-covers are of a gray hue, and so very faint that they are scarcely perceptible. This may be named the Intermediate, (*intermedia*,) it being so slightly different from the following species as to excite doubts whether it is a hybrid produced by a crossing of these two species, or whether these insects are not in reality one species, varying merely from being reared in different species of the elm.

342. LATERAL SAPERDA, *Saperda lateralis*, Fabricius.

Mining the inner bark of dead trees and logs of the common elm, a grub in every respect the same with that last described above, and about

the first of June producing a similar beetle, differing in being destitute of the transverse bands branching from the lateral stripe upon the wing-covers, its length varying from 0.35 to 0.55.

Two varieties of this beetle may be noticed, the one (*abbreviata*) having the stripe along the outer side of the wing-covers narrow and not extending to their tips, the other (*suturalis*) showing a slender orange colored line along the inner edge of the wing-covers their whole length.

343. Six-banded Dryobius, *Dryobius, 6-fasciatus,* Say. (Coleoptera. Cerambycidæ.)

A similar but larger worm than the preceding, found in the same situation, producing a black beetle of similar form, with the margins of its thorax yellow, and also its scutel and four equidistant oblique bands on its wing-covers, the last one placed on their tips, its length about 0.70. This species is exceedingly rare, but probably occurs in all parts of the Union.

The Elm bark-beetle, § 60, produces small pin-hole perforations in the bark; and the Pigeon Tremex, which will be described under the Maple, bores in the wood of this tree.

AFFECTING THE LEAVES.

Quite a number of different worms are met with upon the elm, eating its leaves; but nearly all of these are oftener seen upon other trees, under which their description more properly belongs, and to most of them has already been given. A word or two as to the general appearance of these is all that will be required in this place.

Of *large thick-bodied worms*, there is found on this tree

The Polyphemus moth larva, § 181, of an apple green color, with bright orange points and a row of oblique pale yellow stripes along each side.

The Io emperor moth larva, § 81, apple green, with branching prickles and a brick red or orange stripe along each side.

The Ash Sphinx (*Sphinx quadricornis*) larva, a cylindrical green worm with a pale blue or green horn at the end of its back. See Ash insects.

The American Cimbex larva, a cylindrical glaucous yellowish white worm, coiled like a snail's shell and having two black lines along its back; much more common on willows, under which it will be described.

Of more *slender bodied thorny worms* there are

The White-bordered butterfly larva, black, with a row of rust-red spots on the back, and more often met with on willows, which see.

The Progne, § 142, and the White-C. butterfly, § 143, similar but paler colored worms.

Of *hairy-bodied caterpillars* there are

The Fall web worm, § 81, in cobweb-like nests the latter part of summer.

The Vaporer moth larva, § 32, with pencils of long black hairs, and on its back short yellow brush-like tufts.

ELM. LEAVES.

Of *measure worms*, having but ten feet, there are

The CANKER WORM, § 38, the V-MARKED MEASURE WORM, § 39, and the NEW YORK MEASURE WORM, (*Erannis subsignaria*, Hubner,) which has been so noted a pest for many years in the metropolis of our State, and is most destructive to the lindens, under which the description of it will be given.

Of worms which are peculiar to the elm, or are more common on this than other trees, there are several, which are not yet known to me in their perfect state, and I have but one species to present at this time. This is an inhabitant of northern Europe, and has not been known hitherto as occurring also upon this continent.

344. NOVEMBER MOTH, *Oporabia dilutata*, Schifferrmyller. (Lepidoptera. Geometridæ.)

Feeding on the leaves in spring, a dirty green measure worm, beneath paler bluish white, its breathing pores forming a row of orange red dots along each side, where is sometimes a yellow line also; living openly exposed upon the leaves and in the summer entering the ground to pass its pupa state; the moth coming out in November, its wings usually as thin as bank note paper and semi-transparent, very pale gray, the fore pair with faint indistinct transverse marks of a darker color, whereof two near to and parallel with the hind edge are commonly the most distinct, and two others extending from the middle of the inner margin to a small dusky streak in the centre of the wing, the hind wings fringed all around with whitish hairs. Width about 1.30.

Slowly flying among the leafless bushes upon mild days in November I have met with this moth. It coincides so perfectly with the figures and accounts given of the European November moth, as it is termed in English works, that I cannot deem it anything else than the same species. A more accurate representation of my specimens could scarcely be made, than is the figure of the pale variety of this species, in Westwood and Humphrey's British moths. It is often more fully and distinctly marked, according to the statements of authors, than in the specimens from which the above description was taken. So extremely variable is it, that nearly a dozen species have been made from its varieties, by different writers.

345. LADDER CHRYSOMELA, *Chrysomela, scalaris*, Le Conte. (Coleoptera. Chrysomelidæ.)

Feeding upon the leaves throughout the season, a shining hemispherical bottle green beetle with silvery white wing-covers, on which are several bottle green spots and a broad jagged stripe on their suture, its wings rose red and its antennæ and legs rusty yellow. Length 0.30 to 0.40. Common also upon willows.

346. ELM GALERUCA, *Galeruca Calmariensis*, Linnæus. (Coleoptera. Galerucidæ.)

An oblong oval beetle 0.25 long, of a grayish yellow color with three small black spots on its thorax, a broad black stripe on the outer part

of its wing-covers and a small oblong spot near their base, though originally named by Linnæus from a small seaport town of Sweden, is common over the chief part of Europe, feeding upon the leaves of the elm, to which it is sometimes very destructive. It has been introduced from thence into this country, and on its first appearance in the city of Baltimore some twenty years ago, it and its larvæ, which are thick cylindical blackish six-footed grubs, wholly denuded the elms of their leaves, for several successive seasons.

The following incident, verbally communicated to me by the Rev. John G. Morris, D. D., of Baltimore, merits to be related in this connection, it being one of the prominent popular errors prevailing in our country with respect to insects, to regard them as a unit, all alike in their nature and habits, and hence, if a remedy is discovered to be efficacious against one particular insect, the experimenter at once concludes, with the fullest confidence, that it will be similarly efficacious against all other insects.

Soon after this beetle commenced its destructive career in Baltimore, a representation of the evil was communicated to one of the most eminent and justly distinguished men of science in our country, with a request that he would inform them of some remedy for it. He, not being versed in this particular branch of Natural History, inferred the insect to be the Canker worm, which had not long before made very similar havoc upon the elms in his own neighborhood; and he accordingly replied, informing them that if they would surround the trunks of their trees with collar-like troughs and keep these filled with fish-oil, he doubted not they would find it an effectual remedy. With much care and at some expense this measure, coming from such a respectable source, was extensively resorted to. But they soon learned that what is sauce for the goose is not always sauce for the gander, or in other words, that what is an effectual remedy for one insect on elms is not equally efficacious for all other insects upon the same tree. As some had predicted who had informed themselves of the habits of this beetle, the protected trees received not the slightest benefit from this measure.

The GRAPE-VINE FLEA-BEETLE, § 128, a very small greenish-blue or purple jumping beetle, and the GOLDSMITH-BEETLE, § 57, a large shining lemon yellow beetle, also inhabit the elm, eating the leaves.

347. ELM GALL-LOUSE, *Byrsocrypta Ulmicola*, new species. (Homoptera. Aphidæ.)

In June, an excrescence or follicle like a cock's comb, arising abruptly from the upper surface of the leaf, usually about an inch long and a quarter of an inch high, compressed and its sides wrinkled perpendicularly and its summit irregularly gashed and toothed, of a paler green color than the leaf and more or less red on the side exposed to the sun; opening on the under side of the leaf by a long slit-like orifice; inside wrinkled perpendicularly into deep plaits and occupied by one female and a number of her young, some of which are often strolling outside upon the under surface of the leaf,

minute oval yellowish white lice 0.02 long, with blackish legs, the female more or less coated with white meal on her back, 0.07 long, oval and pale yellow with blackish legs and antennæ. Though I have not yet met with winged individuals, they in all probability pertain to the genus to which I have referred this species above. The galls may frequently be noticed on elm leaves. By the middle of summer they become tenantless, dry and hard and of a blackish brown color.

4. THE POPLAR—*Populus grandidentata, etc.*

AFFECTING THE TRUNK.

348. Broad-necked Prionus, *Prionus laticollis,* Drury. (Coleoptera. Cerambycidæ.)

In the wood of the trunk and roots of different poplars, a white soft grub as thick as one's thumb and otherwise similar to that of the Chestnut-brown or Pennsylvania Prionus, § 234*; producing an oval moderately convex black long-horned beetle 0.90 to 1.50 long and less than half as broad, its wing-covers rough from confluent irregular punctures and with two or three raised lines, its thorax with three irregular teeth along each side, and its antennæ of twelve joints resembling little conical cups placed one within the other and projecting upon their lower side like the teeth of a saw; appearing abroad in July.

349. Poplar-borer, *Saperda calcarata,* Say. (Coleoptera. Cerambycidæ.)

Beneath the bark and in the interior of the wood boring a hole 0.45 wide and less than half as high, a yellowish white footless grub 1.75 long, slightly tapering and divided by strong constrictions into twelve rings, the first one largest and with its upper side flattened, tawny and slopeing forwards, and in all other respects resembling the Apple-tree borer, § 2; passing its pupa state in the tree and coming out in August and September, a pale bluish gray long-horned beetle, about an inch long and a fourth as broad, finely dotted with black, its scutel ochre yellow and also three stripes on its thorax and several spots on its wing-covers. See Harris' Treatise, p. 93.

AFFECTING THE LEAVES.

350. White-S Clostera, *Clostera albosigma,* Fitch. (Lepidoptera. Notodontidæ.)

Early in July, eating the leaves and reposing in a cavity formed of leaves drawn together like a ball, a large black caterpillar with white and yellow dots and stripes and a hump on the back of its fourth and eleventh rings; its pupa lying in a cocoon attached among the leaves, and in ten days giving out the moth the latter part of July; the moth grayish-brown, its fore wings crossed by three faint paler streaks, the two first parallel, the hind one with its outer half silvery white and strongly waved in the shape of the letter S; width 1.50. See Transactions, 1855, p. 506.

* Since my last report was in print I have ascertained that the fifth volume of Degeer's work was not published till 1775. Forster's name of this insect consequently has the priority, and Chestnut-brown Prionus, *Orthosoma brunnea,* Forster, should be substituted for the name I have in that place given.

POPLAR. LEAVES.

351. American Clostera, *Clostera Americana*, Harris.

Consuming the leaves in summer, a pale yellow caterpillar with two little black warts close together on the back of its fourth and eleventh rings, three slender black lines on its back and three in a broad dusky stripe along each side; its pupa passing the winter in a cocoon under leaves or rubbish on the ground; the middle of June giving out a pale grayish moth more or less varied with brown, its fore wings with three whitish bands, the first transverse and dislocated, the second oblique and giving off a transverse branch from its middle which runs to the inner margin uniting with the third band, the two thus forming a letter V, a faint whitish band across the middle of the hind wings; width about 1.35. See Harris' Treatise, p. 334.

The *Clostera suffusa* of Stephens was very probably described from a specimen of this species which found its way accidentally into the collection from whence he obtained it. Our moth shows a whitish spot or stigma near the center of the fore wings, this spot being sometimes dusky in its middle, as represented on the left side in Stephens' figure. Were the first band in this figure dislocated with its outer half carried somewhat towards the base of the wing, and the pale shade across the middle of the hind wings less angularly bent, all doubts upon this subject would be removed.

352. V-marked Clostera, *Clostera vau*, new species.

A moth which is very similar to the preceding, but darker colored and smallar, with the bands more slender and distinct, may be readily distinguished from that species by its having the first band not dislocated but in its middle strongly curved backwards, the apex of the curve usually forming an acute point. The last band also is much more strongly undulated near its outer end, curving backwards almost in a semicircle, and is of a much more vivid white color, and broadly bordered on its hind side with bright rust-red. Its hind wings also are destitute of the paler band across their middle. Its width is about 1.20.

I am unacquainted with its larva, but like the other species of this genus, it doubtless feeds on the poplars and willows. Though quite rare in my own vicinity, it is oftener met with than the two other species.

Other worms feeding on the leaves of poplars are larvæ of the Io emperor moth § 81, the White-bordered butterfly, oftenest met with on willows, the New York measure-worm more attached to the linden, and others which are yet unknown in their perfect state.

353. Poplar-stem gall-louse, *Pemphigus Populicaulis*, new species. (Homoptera. Aphidæ.)

Forming imperfectly globular galls the size of a bullet at the junction of the leaf with its stalk, these galls having a mouth-like orifice on their under side, and a large cavity within, crowded with small dull white lice and their white cast skins, and with winged lice of a blue black color, their antennæ reaching beyond the base of their wings, the rib-vein of their

fore wings black, thick, much thicker at its apex along the inner margin of the stigma-spot, and the short veinlet bounding the anterior end of this spot more slender than the rib-vein; its length 0.10, and to the tips of its wings 0.15.

This insect is attracting much notice in the city of Albany at the time these pages are passing through the press. The latter part of June, an article appeared in one of the daily papers of the city, directing attention to the remarkable phenomenon presented by the poplars in a particular yard on the opposite side of the river in Greenbush, most of the leaves having at their base a little ball filled with insects. Several of the leaves of these trees were kindly procured and forwarded to me by L. A. Orcutt, Esq. Visiting the city personally a fortnight after, I was informed the

same bullet-like excrescences were then growing on the poplars everywhere in and around the city, and were so numerous on particular trees that scarcely a leaf could be found which was destitute of them. The specimens shown me were taken from the River poplar or Cotton tree, (*Populus lævigata*, Aiton.)

Three years since, on the twenty-seventh of June, a leaf which had fallen from a Lombardy poplar in my yard, was found wilted and somewhat shrivelled, which showed on the middle of its stalk, a bullet-like gall, of which, and the insects within it, full memoranda were taken, which describe these Albany leaves perfectly; and when the leaves fell from this tree in autumn, a few were found among them, more faded than the others and having these same excrescences, but placed at the base of the leaf instead of on the middle of its stem, and the galls having now become black, dry and hard.

These excrescences are about a half inch in diameter and somewhat more long than thick. They are of a pale green color, similar to that of the stalk on which they grow. At their base they are wrinkled with parallel plaits running from the excrescence a short distance downwards upon the stem on which they grow, which stem is slightly thickened at this point. On their upper side the surface is rough from numerous small smooth elevations resembling pimples, some of them round, others oblong, which are green at first, but soon become whitish and remain of this color after the gall is dead and black. They are of a weak leathery texture, having a large cavity inside, the walls being the thickness of thin leather. The cavity within is completely filled with a confused mass of little lice, sprinkled over and obsured by a white meal-like powder, and intermingled with them are a multitude of white shrivelled cast skins. These lice when more particularly examined, are fouud to be of three different kinds, namely, larvæ, pupæ, and perfect or winged flies. In the first gall which I inspected more than a hundred and fifty of these insects were counted.

The LARVÆ, or smallest insects in these galls, are about 0.03 long, but variable in size. They are of a dull white color with the knees a little dusky and the eyes blackish. They are oval, slightly narrower anteriorly, with their sutures well marked by transverse impressed lines.

The PUPÆ are similar to the larvæ in color and form, but of a larger size, and particularly distinguished by having little oval scales, which are the wings in their rudimentary state, pressed against each side of the body. Their feet as well as their knees are dusky, of a much darker shade in some than in others, and in some individuals the head and thorax have a reddish tinge. Their length is about 0.07. These were far the most numerous individuals in the gall first examined.

The WINGED FLIES are of a blue black color throughout, sometimes with the base of the abdomen and of the legs dull brownish yellow, and when newly hatched the under side or even the whole of the abdomen is dusky lurid greenish. The wings are closed together horizontally upon the back before the fly has left the gall, but after it has used them, they are held together above the back in a steep roof. They are whitish hyaline, not clear, being like the body so dusted over and dimmed with white meal-like powder that they appear almost opake until this extraneous matter is brushed off. The vein forming the outer margin is coarse and blue-black from the base to the commencement of the stigma, and very fine and slender beyond that point. The rib-vein also has the same color and is still more thick and

coarse till it reaches the stigma, where it is widened to twice its previous thickness, forming a broad blue-black margin along the inner side of the stigma to its tip, whilst the branch running to the outer margin and bounding the anterior end of the stigma is much more fine and slender. The stigma is dull whitish and much more opake than the rest of the wing. It has an elliptic outline, its length about double its width and slightly wider than the space forward of it between the rib-vein and the outer margin. The oblique veins are pale yellowish and towards their tips slightly thicker and dusky. Around the origin of the two first a slight duskiness is perceptible upon the inner side of the rib-vein. The first oblique vein is straight. The second arises almost in contact with it, and is straight till near its tip, where it perceptibly curves towards the inner margin. The third vein is abortive or invisible through the first fourth of its length. The fourth, which arises from the middle of the inner side of the stigma, at first slightly approaches the third vein and then curves gently towards the outer margin, and at its tip bends again in the opposite direction. Its tip is somewhat nearer the tip of the third vein than this is to the second, the tips of the first and second being still more distant from each other and about the same distance that the tip of the fourth is from that of the rib-vein. The antennæ are rather thick and thread-like. The body varies in length from 0.08 to 0.10, but to the tip of the wings it is more uniform, measuring 0.15. These individuals are winged females, producing larvæ of a pale yellow color.

Galls analagous to those here described grow upon the leaf stalks of the Lombardy and the Black poplar in Europe, from the attacks of the *Pemphigus bursarius* of Linnæus ; but I judge our insect to be different from that, from specimens of the fly and its gall received from Dr. Signoret, and the full description of it in its different stages given by M. Fonscolomb (Ann. Soc. Ent., France, x, 193), the fly being paler in its color, and its gall spirally coiled somewhat like the shell of a snail.

The manner in which these insects produce these galls on poplar leaves is described by Mr. Rennie in his Insect Architecture, and may here be repeated, as the process is no doubt the same in ours that it is in the European species.

Often when the galls are opened a single individual is noticed therein much exceeding any of the others in its size and destitute of wings. This is the female parent from which the whole brood in each gall is descended. After wandering about upon the limbs and leaves during the first period of her life, she becomes stationary at this point on the leaf stalk, occupied first in erecting a house for her shelter and protection and then rearing her family therein. As she turns herself around, she makes a number of punctures in the leaf-stalk with her sharp needle-like beak. The sap which issues from these wounds, by its exposure to the air becomes thickened and curdled, whereby a thick fleshy wall of a living vegetable substance grows up around her, intermediate in its texture as in its situation between the wood and the leaf, being softer than the former and harder than the latter. And by puncturing this at its summit, a further exudation of the sap occurs, whereby the wall closes together over her, thus forming a little globe the size of a pea, within which the insect is securely sheltered from birds and predaceous insects. If in want of food she has only to insert her beak in the side of her cell and suck therefrom the nourishment she requires. Her eggs are next strewed around upon the inner surface of this gall, although the cavity has only sufficient space to contain them and the parent. But

the young insects hatching therefrom, puncturing and drawing their sustenance from the same surface, cause the gall to increase gradually in its size, in the exact ratio in which the family within grow to require additional room. I observed no orifice in the smaller galls; but when a portion of the inclosed insects have acquired wings and are ready to come abroad, a longitudinal slit is formed upon the under side of the gall, like a mouth with the lips closed, and the gall then has some similarity to a bivalve shell, as that on the European poplars has to a univalve. Through this orifice the flies coming out into the light of day, open their wings a few times to air and strengthen them, and then mount upon them and pass away. If two or three of the galls happen to be laid upon a table, on the adjacent window will soon be found a multitude of these flies which have been arrested in their flight outwards. As already stated, at least a portion of the flies which begin to issue from these galls the last of June, are females giving birth to living young instead of eggs. But their further history and in what state they pass through the winter and till another crop of leaves put forth for their accommodation yet remains to be investigated.

In some instances two females fix themselves at the base of the same leaf, whereby their galls grow into each other, making an excrescence of double the usual size, in which are two cavities and two orifices.

Secluded as these insects are within the tough leathery walls of these galls, they are but little molested by those numerous insect enemies whereby the forces of the Aphides are so often routed and infested vegetation is cleansed from these pests. In one instance, however, the larva of a lady-bird (*Coccinella*) was noticed standing like a vigilant sentinel at the orifice of a gall, occupying himself no doubt in seizing and devouring the flies one after another as they issued therefrom, before their wings had acquired the requisite suppleness to enable them to fly away.

Although the leaves at whose bases these galls grow retain a healthy vigorous aspect till after the insects have escaped, they are undoubtedly weakened from having such an amount of their juice drawn away for the support of these galls and the insects within them, and will prematurely wither and fall from the trees. And when these insects become so numerous as they at present are around Albany, the trees will be enfeebled by them. But as it is merely the leaf stems which they infest, the life of a thrifty tree will be jeopardized only by their continuance in force through a series of years, and that they will thus continue is not to be expected.

354. POPLAR GALL-LOUSE, *Pemphigus Popularia*, new species.

Late in autumn, wandering up and down the trunk of the Balsam poplar, a gall-louse closely like the preceding, but its abdomen green, its antennæ short, reaching but two-thirds the distance to the wing sockets, and the rib-vein of its wings not thicker along the inner margin of the stigma; its length 0.13 to the tip of its wings.

In connection with the Poplar-stem gall-louse I introduce this species, it is so very similar, although I know nothing of its habits, beyond the fact that it was noticed in great numbers upon a Balsam poplar, *P. balsamifera*, Linn., upon a warm sunny day in the middle of October, wandering up and down the trunk of the tree, in company with a species of Aphis. These were winged females, one of which was observed to extrude a small larva 0.02 in length, of a pale yellow color with watery white head and legs.

As noticed at that time, these flies were black, slightly dusted over with a glaucous gray powder; the abdomen dull green with a small coating of white flocculent wool, its opposite sides parallel and its tip abruptly rounded; the antennæ short, thick and thread-like; the wings dull hyaline, their rib-vein black and the oblique veins slender and blackish with the basal third of the third vein abortive and the fourth vein perceptibly thicker towards its base; and the small branch of the rib-vein bounding the anterior end of the stigma having nearly the same thickness with the rib-vein.

355. POPLAR-BULLET GALL-LOUSE, *Pemphigus Populi-globuli*, new species.

In July, on the leaves of the Balsam poplar slightly above their base, an irregular globular apple green gall the size of a bullet, projecting from the upper surface of the leaf, with a curved mouth-like orifice on the under side, the cavity within containing numerous small pale green and smaller dusky lice with the end of their bodies covered with short white cotton-like threads, and larger winged ones which are of a black color, with the abdomen dusted over with white meal and with thin white woolly fibres on the back, and their antennæ reaching the base of the wings, which are clear hyaline, their veins slender and white or colorless, except the outer marginal vein which is black to the end of the stigma, and also the rib-vein, which is much thicker at its apex; their length 0.07 and to the tip of the wings 0.11.

I find several galls of this kind on a Balsam poplar in my yard, at the moment of sending these pages to the press. That I might render the history of the preceding species more complete, I wanted to think I here had the same insect at its summer employment which I had previously met with in autumn after its work for the season was closed. But on placing the two side by side I see some differences between them, so slight that it may not be in our power to distingish them with any degree of confidence in preserved specimens in the cabinet, yet so palpable that I am compelled to regard them as distinct species. And as in the gall-flies on oaks so also in the gall-lice on poplars it would seem that Nature designed to show how closely alike she could make several of these minute insects, and then placed them in dissimilar galls that the observer of her works might be assured they were really different the one from the other.

These flies differ from those of *P. Popularia* in being uniformly a size smaller, with wings more clear and glassy, their veins more slender and quite colorless, the stigma less opake than in that and other species of these insects, and the rib-vein more thick where it bounds the inner margin of the stigma and especially at its apex. The oblique branch of the rib-vein bounding the anterior end of the stigma is more slender than the marginal vein.

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The fourth oblique vein is slightly thicker at its base, where it is also a little dusky. The abortive basal third of the third vein is traced by a very slender line, which here appears to be more distinct than in any of the kindred species. The inner margin shows the same duskiness for a short distance at and forward from the tip of the first vein that is common to the insects of this family. The abdomen is dusted over with a white mealy powder, with a black band on the hind part of each segment from the absence of this powder.

The gall grows from the midvein of the leaf slightly above the point where it passes into the stem, instead of at or slightly below this point where the Poplar-stem gall first described is situated. And hereby this gall has a narrow portion of the base of the leaf below it. It grows either wholly upon the upper side of the leaf, or with a small portion protruding outwards from the under side. It is of a spherical form, but more or less irregular and with the surface uneven. It varies from a little over a quarter to a half inch in diameter, and is of a pale apple green color, sometimes with a deep carmine red cloud on the side most exposed to the light. Its walls are nearly a tenth of an inch thick and very juicy and brittle, but become, as in other galls, more dry, wilted, and leather-like when old. The midvein where the gall is situated becomes thickened and curved or otherwise distorted, and the orifice of the gall opening along its side partakes of this curve.

The winged flies are females, producing eggs of a dull wax color, the eyes of the inclosed larva appearing like two black dots near one end, as in other instances in this genus. These eggs hatch within a few moments after they are extruded. Before they leave the interior of the gall these flies are mostly of a pale lurid green color with the knees and feet dusky, and only the antennæ and the thickened tip of the rib-veins are then of the black hue which the body acquires after its exposure to the light. And after they have come abroad the under side of the abdomen often retains this same lurid green color.

365. Poplar-vein gall-louse, *Pemphigus Populi-venæ*, new species.

In July an oblong compressed excrescence like a cock's comb, of a light red color varied with pale yellow, growing from the midvein of Balsam poplar leaves on their upper side with an orifice on the opposite under side; a cavity within containing a multitude of lice and their white cast skins, interspersed with a whitish meal-like powder; those with wings being black, with coarse thread-like antennæ reaching to the base of the wings, which, with their oblique veins, are pellucid and colorless, the coarse rib-vein being blackish and more thick at its tip along the inner margin of the stigma, and the vein of the outer margin being blackish and somewhat coarse from its base to the stigma; its length 0.05 and to the tip of the wings 0.08.

A number of these galls may sometimes be observed upon the leaves of particular trees. They are nearly semicircular and half as high as long, being usually over a half inch in length, with an uneven surface, their walls thick, brittle and succulent. They are commonly placed near the

base of the leaf, but sometimes in its middle. Among the insects in the cavity inside may be found the larvæ, pupæ and perfect insects of both sexes, which sexes can be distinguished in all the stages of their growth by their colors, the females being dusky and the males dull green with whitish legs and antennæ. A single wingless individual, larger than any of the others in the gall, is the parent or at least the progenitor of the entire family. As an instance of the tenacity of life which insects possess in their pupa beyond any other period of their existence, it may be observed that a wingless female with a larva and a pupa of this species, having been attached with gum to a slip of card, the two first were noticed twenty-four hours afterwards dead and shrivelled to mere shapeless specks, whilst the pupa remained alive, plump and strong, actively engaged in efforts to break its feet from the dried gum wherein they were fettered.

The FEMALE LARVÆ are dusky on the body and legs, with a tuft of white flocculent cotton-like fibres projecting backward from the end of the body, and a coating of white mealy powder over the rest of the surface. They are quite small, measuring about 0.025 in length, straight along each side and slightly narrowing from behind forward.

The MALE LARVÆ are less numerous than those of the female and double their size. They are very pale dull green with whitish antennæ and legs, the feet sometimes slightly dusky. They are coated with white meal and tufted at the tip like the female, but their bodies are more tapering forward and show the impressed sutures quite distinct.

The MALE PUPÆ are oval with the head and first segment of the thorax narrower. They are dull pale green with the second segment of the thorax and the wing-scales paler and watery in their appearance, and the sutures of the abdomen less distinct than in the larvæ, which they slightly exceed in their size.

The FEMALE PUPÆ are dusky like their larvæ, with the wing-scales and the thorax between them of an obscure whitish or pale watery color.

The WINGLESS FEMALE, the parent of the colony, is as broad as long, measuring 0.04 to 0.05 in length, the hind end being usually concave or notched, and the abdomen elevated or humped in its middle, resembling that of some spiders. She is pale dusky with two rows of snow white dots formed of a mealy or pruinose substance, along each side of the back, the dots of the inner row being more numerous. Her head is darker and her legs dull pale yellowish with the feet dusky.

As some of the gall-lice now described may every year be met with upon the poplars planted in the grounds around our dwellings, I have given a somewhat extended account of them, thinking some of the persons into whose hands this Report will come, will, with the aid thus furnished them, be curious to examine these insects, whose habits are in many respects so interesting and truly remarkable. In addition to those which have now been noticed, several other species of the Aphis family dwell more openly exposed upon the leaves and green twigs of our poplars. I refrain from presenting these and similar insects belonging to oaks and other trees, until I shall have re-examined them in their living state, and compared them with the figures in the beautiful Monograph of Koch, that I may assure myself more fully whether several of them be not, as I suppose them, identical with those occurring upon similar vegetation in Europe.

5. THE BIRCH—*Betula lenta, etc.*

AFFECTING THE LEAVES.

The several kinds of birch appear to be the least infested by insects of any of our forest trees of the deciduous class. This fact recommends them strongly to public favor as ornamental trees for parks and pleasure grounds, they being also easy of cultivation though rather slow in their growth. They probably owe their immunity from insects to the spicy essential oil which imparts to their bark so pleasant a flavor. I know of no borer in the wood or bark of the birch, and very few worms which feed upon its leaves. Occasionally the V-MARKED measure worm, § 39 has been noticed in this situation and two or three other larvæ of small moths whose perfect state is not yet known. A few insects which puncture the leaves and green succulent twigs to sip their juices and a single beetle eating the leaves, are, according to my observations, the only insects which are oftener met with upon birch than on other trees, and are therefore to be considered under this head.

357. TRIPLE-ROWED CRIOCERIS, *Syneta tripla,* Say. (Coleoptera. Criocerida.)

In May and the fore part of June, eating the leaves of this and various other trees, an oblong chestnut-brown and closely punctured beetle, with wing-covers usually pale dull yellowish except on their suture and their punctures forming about three rows between each of the three raised lines, its length 0.25 and about a third as wide. A common insect in our State.

358. VARIABLE LEAF-HOPPER, *Athysanus variabilis,* Fitch. (Homoptera. Tettigonidæ.)

Puncturing the leaves and succulent shoots and extracting their juices, from the middle of June till the middle of July, an oblong oval leaf-hopper of a sulphur yellow color, its wing-covers commonly with an oblique black stripe, their tips hyaline, its thorax and scutel often tawny yellow or black, its length 0.20.

This insect may every year be met with in numbers upon birch trees and also upon alders. It was once found literally swarming upon a white birch standing apart from other trees.

359. SMALLER LEAF-HOPPER, *Athysanus minor,* Fitch.

From the middle of June till the middle of August, a similar leaf-hopper to the preceding, but of a cinnamon color, including its face, and having a colorless hyaline spot on the middle of its wing-covers and a larger one on their tips, its length 0.18 to 0.20.

360. WINDOWED LEAF-HOPPER, *Athysanus fenestratus,* Fitch.

From the middle of June till the last of July, a leaf-hopper resembling the foregoing species, but with blackish wing-covers with similar hyaline spots and a smaller third one placed on the middle of the inner margin,

and its forehead black with a pale yellow band between the eyes, its length 0.20.

The SPRUCE LEAF-HOPPER § 282 is also frequent upon the birch, and a few additional species which are common to this and the hornbeam and alder may hereafter be noticed under these last. The BUTTERNUT TINGIS, § 193 is also common on birch leaves.

ERRATA.

Page 416, 1st line, "sods," not rods,
Page 426, 9th line from top, "hole," not pole.
Page 433, lowest line, "above," not alone.
Page 437, 18th line from top, "style of board fence."
Page 454, top line, "the side," not aside.
Page 465, and other places, "bowlders," not bolders.
Page 466, 21st line from top, "leveled off," not beveled.
Page 467, 8th line from bottom, "to be built."
Page 472, 10th line from bottom, "sheeves," not sheers.
Page 475, figs. 63, 64, 65, 66, 67, are reversed.
Page 483, 16th line from top, "pin them," not pin in.
Page 489, 5th line from top, "vise," not vice.
Page 492, 21st line from top, "animals," not animal.
Page 501, 9th line from bottom, "full of doubt," not free from.
Page 476, fig. 63 reversed.

Some other typographical errors have escaped notice in the correction of the proof, but will readily be corrected by the reader.